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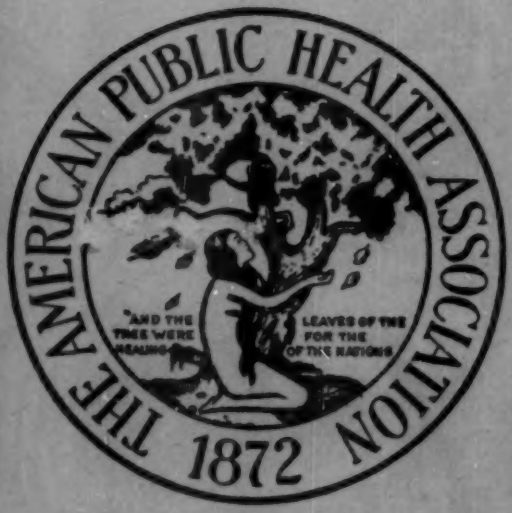

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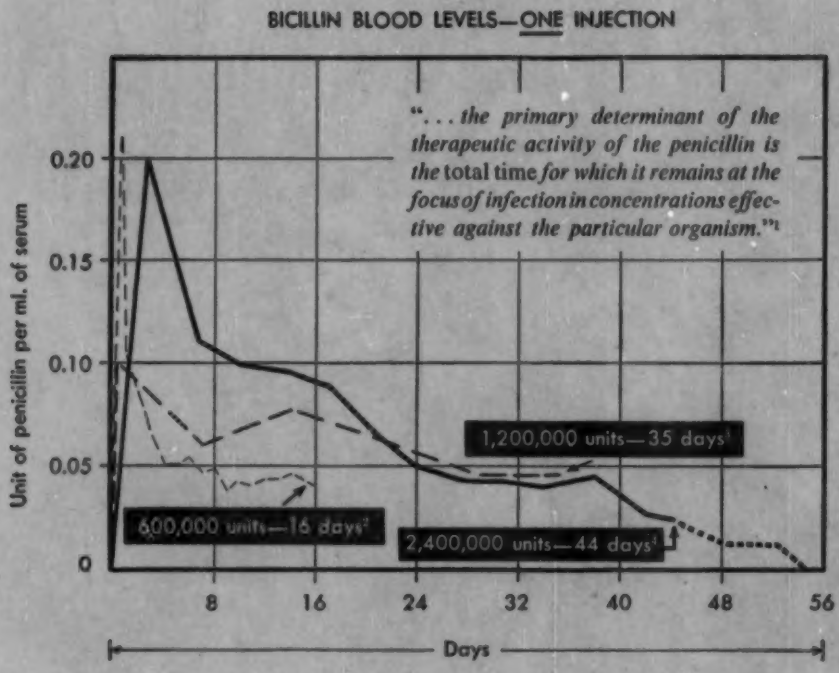
volume 46

number 10

PROLONGED ACTION



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1. Eagle, H., et al.: J. Lab. & Clin. Med. *41*:122 (Jan.) 1953. 2. Welch, H., et al.: Antibiot. & Chemo. *3*:1053 (Oct.) 1953. 3. Stollerman, G.H., and Rusoff, J.H.: J.A.M.A. *150*:1571 (Dec. 20) 1952. 4. Welch, H., and Putnam, L.E.: Personal communication.

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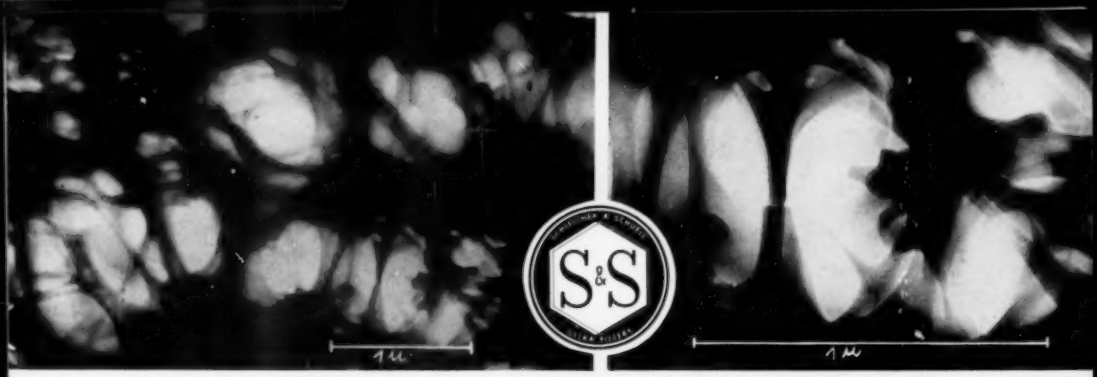


Microtome cut showing the structure of membrane filter, medium porosity.

Enlarged microtome cut showing cavities of membrane filter, medium porosity.

ULTRA FILTERS

Description, specifications, pore sizes, applications

S&S Ultra Filters have many advantages when compared with the standard fiber and adsorption filters. Their extremely fine pores and sieve action are valuable wherever separation or enrichment of finely dispersed particles in liquid is desired. They are used in filtration and diffusion processes, and permit the investigation of retained particles on the surface of the filter. This makes it possible to work with colloid chemicals and biological substances without loss of materials.

Structure

Structurally, S&S Ultra Filters are porous membranes with extremely uniform microstructure and a very smooth surface. Their efficiency is due to a very fine pore system which has the function of a most efficient sieve. There is practically no adsorption when using these filters. The thickness of S&S Ultra Filters depends upon the permeability of the filter, and ranges between 50 and 120 microns.

Surface

The brilliant white surface of S&S Ultra Filters facilitates the recognition of particles on the surface. Filters may be made transparent by liquids of the same refractive index, as for example, immersion oil. The precipitated particles are thus made visible on the surface of the filter for microscopic determination and examination. All possibilities of using direct light and phase contrast examinations are given. Colored membranes and membranes with different sized grids are available.

Different Types of S&S Ultra Filters

S&S *Membrane Filters* and S&S *Ultrafine Filters* are used with aqueous solutions. They are resistant to the following chemicals when exposed for approximately one hour: 20% Sulphuric Acid; 20% Nitric Acid; 20% Hydrochloric Acid; 1% Sodium or Potassium Hydroxide; 8% Ammonia. Most plant and mineral oils, and dilute alcohol solutions do not affect these filters. However, low molecular weight alcohols, ketones, esters and chloroform should be avoided.

S&S *Cella Filters* and S&S *Ultracella Filters* are made of regenerated cellulose and are resistant to organic solutions. If used with solvents not miscible with water, water content in the filter must be displaced, preferably with ethyl alcohol. The interfacial tensions of these filters result in a shift of the relationship between pore size and particle size in such a way that finely dispersed particles such as proteins may be retained by filters of larger pore size than the particle size of the protein. S&S Ultracella Filters are subject to change when being heated or dried. Therefore, these filters should always be kept in moist condition. Sterilization by heat is not recommended.

Applications:

MICROBIOLOGY: **Water; milk and dairy products; foods; beverages; air; isolation of pathogenic bacteria and viruses; sterile filtrates.**

CHEMISTRY: **Filtration of proteins; colloidal particles; molecular weight determinations and other procedures.**

INDUSTRY: **Pharmaceuticals; injectibles; carbon and metals in oil; air; radioactive materials.**

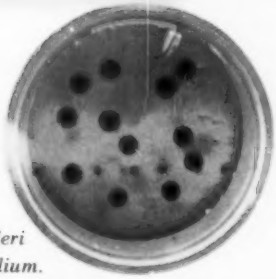
CELLA FILTERS

	Filtration Time (seconds)	*Pore Size*	*Specific Applications*
Coarse	1 — 10″	*Maximum* 1.0 μ *Average* 0.6 — 0.3 μ	Separation of finely dispersed substances. Determination of carbon and metal particles in oil. Filtration of organic solutions, esters, alcohols and ketones.
Medium	10 — 30″	*Maximum* 0.5 μ *Average* 0.3 — 0.2 μ	
Dense	30 — 100″	*Maximum* 0.3 μ *Average* 0.2 — 0.1 μ	Separation of colloidal substances in solvents.
Very Dense	over 100″	*Average* <0.1 μ	

ULTRAFINE AND ULTRACELLA FILTERS

	Filtration Time (minutes)	*Average Pore Size*	*Specific Applications*	
			Biological Investigations	*Colloid Chemical Investigations*
Coarse	1 — 10′	100 — 35 mμ	Filtration of viruses approx. 100 to 150 millimicrons. For example, influenza virus, herpes virus and bacteriophages.	Separation of colloidal particles of approximately 5 to 50 millimicrons. Fine colloidal gold particles. Colloidal silicic acid in chemical analysis. Congo red.
Medium	10 — 30′	35 — 20 mμ	Filtration of viruses approx. 10 to 20 millimicrons. For example, poliomyelitis virus, foot and mouth virus.	
Dense	30 — 100′	20 — 10 mμ	Separation of albumin, globulin; molecular weight approx. 70,000 to 100,000.	
Very Dense *(used for osmotic measurements down to 30,000 molecular weight)*	100 — 500′	10 — 5 mμ		
Super Dense	over 500′	<5 mμ		
Special Filters Ultra Filter LSG 60	300 — 400′	<5 mμ	Thick. High porosity for the quantitative separation and enrichment of albumin in body fluids, (down to a molecular weight of 10,000).	
Osmometer Membrane	over 500′	<5 mμ	For molecular weight determination of high polymeric substances down to 25,000.	
Osmometer Membrane "T"	over 500′	<5 mμ	Molecular weight determination under high temperatures.	

All pore sizes of Cella and Membrane Filters are given in microns.
All pore sizes of Ultrafine and Ultracella Filters are given in millimicrons.

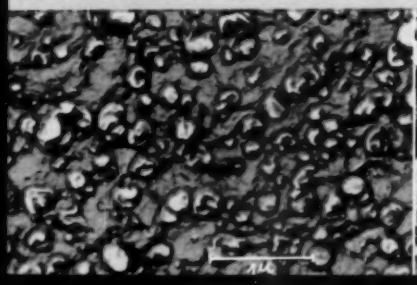


Salmonella schottmülleri on bismuth sulfite medium.

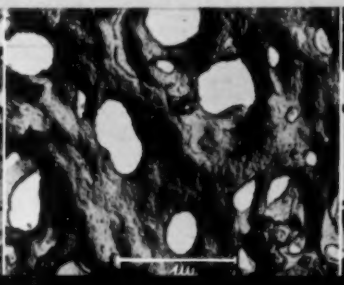
MEMBRANE FILTERS

	Group	Filtration Time (seconds)	Pore Sizes (approx.)	Specific Applications: Biological	Specific Applications: Chemical
TB_2		1 – 2"	*Maximum* 1.3 μ *Average* 1.0 μ	Plankton and worm egg determinations. Detection and cultivation of yeast and molds. Bacteriological examination of water, milk, foods, beverages, soil and air. Isolation and cultivation of pathogenic bacteria.	Separation of finely dispersed particles of microscopic size 0.3 μ and larger. Filtration of air and gases. Dust determination, separation of fine colloidal particles, for filtration of solutions. Water purification. Filtration of clay suspensions. Filtration of hydrous oxides.
Bac-T-Flex		2 – 3"	*Maximum* 1.0 μ *Average* 0.7 μ		
Coarse	1	2 – 4"	*Maximum* 1.0 μ *Average* 0.6 μ		
	2	5 – 6"	*Maximum* 0.8 μ *Average* 0.4 μ		
	3	7 – 9"	*Maximum* 0.5 μ *Average* 0.3 μ		
Medium	4	10 – 15"	*Maximum* 0.45 μ *Average* 0.275 μ	Separation of bacteria from viruses. Bacteria filtration.	Separation of fine particles – particle size between 0.2 to 0.3 μ. Filtration of hydroxides, freshly precipitated AgCl, analytical filtrations producing optically clear liquids.
	5	15 – 20"	*Maximum* 0.4 μ *Average* 0.25 μ	Sterile filtration of liquids.	
	6	20 – 30"	*Maximum* 0.3 μ *Average* 0.2 μ	Separations of pyrogens from injection fluids.	
Dense	7	30 – 40"	*Maximum* 0.275 μ *Average* 0.175 μ	Virus filtration: Separation of larger viruses such as vaccinia, psittacosis and lymphogranuloma inguinale.	Separation of very fine particles – particle size between 0.1 to 0.05 μ. Filtration of coarse gold sol, silicic acid.
	8	40 – 60"	*Maximum* 0.25 μ *Average* 0.15 μ		
	9	60 – 100"	*Maximum* 0.2 μ *Average* 0.125 μ		
Very Dense	10	over 100"	*Average* < 0.1 μ	Special Investigations	

Pore structure of dense membrane filter.



Pore structure of medium membrane filter.



Pore structure of coarse membrane filter.

S&S ULTRA FILTERS

Special Applications

Microbiology

Membrane filters have made possible many new and efficient procedures for the detection, cultivation or filtration of various types of microorganisms. They can be used for the enumeration of bacteria and other microbes in water, sewage, milk, foods, beverages, air and soil. The organisms can be stained and examined directly on the filters or they can be cultivated on the surface of the filters by incubation on suitable culture media. The filters have also proved highly efficient for the isolation or cultivation of pathogenic organisms from various materials. Membrane filter techniques save labor, time, materials and equipment.

S&S Ultra Filters have the following special applications:

1. ***Water***
Enumeration of coliforms, enterococci and other bacteria in water, sewage and other materials.

2. ***Milk and other foods***
Enumeration of bacteria and other microbes in dairy products, other foods and beverages.

3. ***Sanitation***
For control of sanitary conditions in dairy plants, breweries, etc.

4. ***Pathogenic bacteriology***
For detection of Salmonella or other pathogens in water, sewage or feces.

For isolation of *Mycobacterium tuberculosis* and other pathogens from sputum, spinal fluid, urine and other materials.

For filtration or separation of viruses from bacteria and for collection or concentration of rickettsiae and viruses.

For sterile filtrations of all kinds.

Chemistry

S&S membrane and other ultra filters have a wide usage for the filtration of colloidal solutions, for identification of certain proteins, and for many other biochemical or analytical procedures.

These S&S Filters have the following special biochemical applications:

1. ***Enrichment of Protein***
The filters may be used for the enrichment of albumin or other proteins from spinal fluid, ascites, urine and other body fluids.

2. ***Hormones and Tissue Extracts***
The filters may be employed for the identification or preparation of hormones, enzymes or other tissue extracts.

Use of special apparatus and high pressures are necessary for these filtrations. Besides the ultrafine and ultracella filters, special filters with modified densities are available for such filtrations.

3. ***LSG 60 Filters for Albumin Free Filtrates***
The limitation of the quantitative separation of albumin using the ultrafiltration method is on the average of a molecular weight of approximately 10,000. When applying high pressures using special LSG 60 filters, albumin free filtrates may be obtained.

Air Analysis

Membrane filters may be employed for qualitative and quantitative detection of dust particles, metal fumes, smokes and radioactive particles in air. For contrast of colorless particles, green or dark blue filters are available.

Special leaflet on S&S Bac-T-Flex and Bulletin No. 75 describing the filters and special apparatus to be used with ultra filters available on request.

Bulletin No. 76

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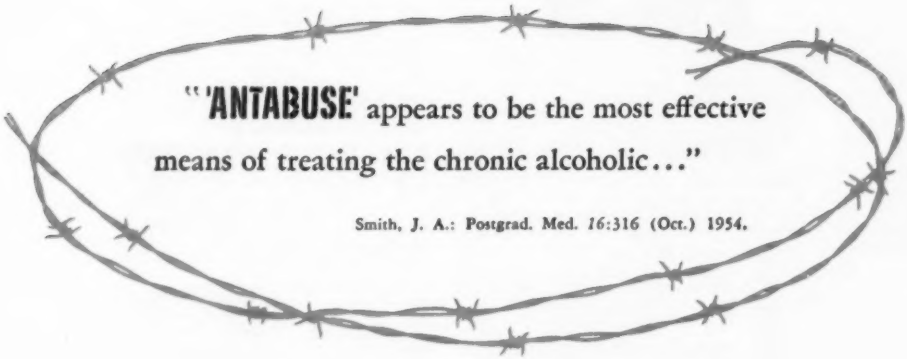

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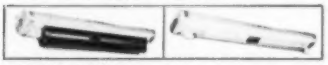

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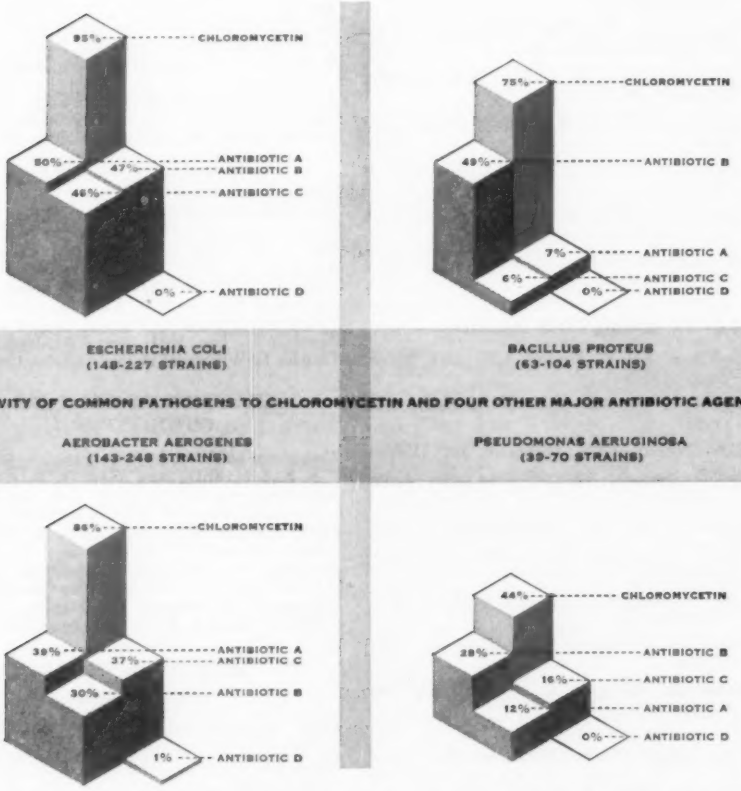

*This graph, based on *in vitro* studies, is adapted from Horton, B. E. and Knight, V.: *J. Tennessee M. A.* 48:367, 1955.

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1. Goodman, L., and Gilman, A.: Pharmacological Basis of Therapeutics, New York, Macmillan, 1955, p. 1153. 2. Brown, H. W., *et al.*: J.A.M.A. *161*:515 (June) 1956. 3. Hoekenga, M. T.: World M. J. *3*: (Sept.) 1956.

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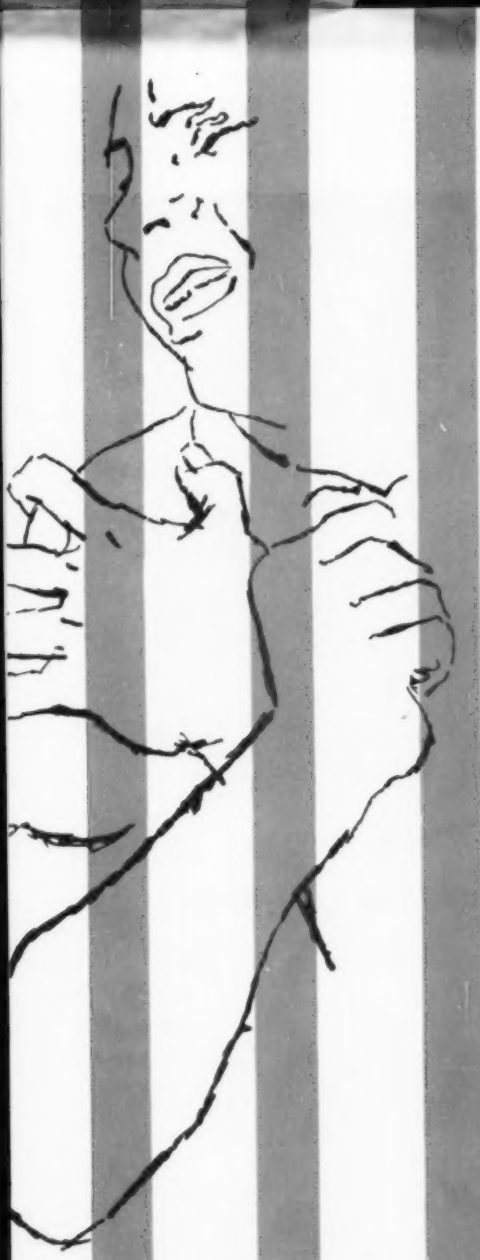

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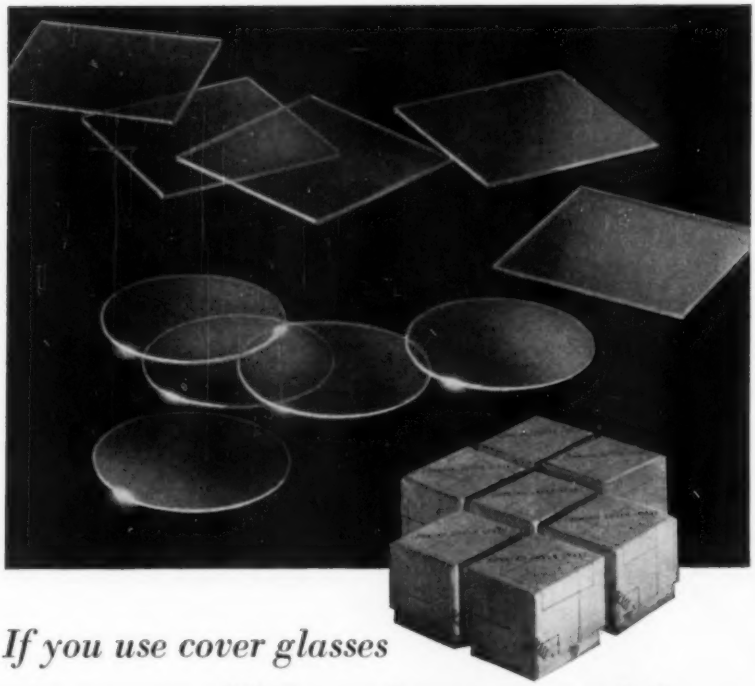

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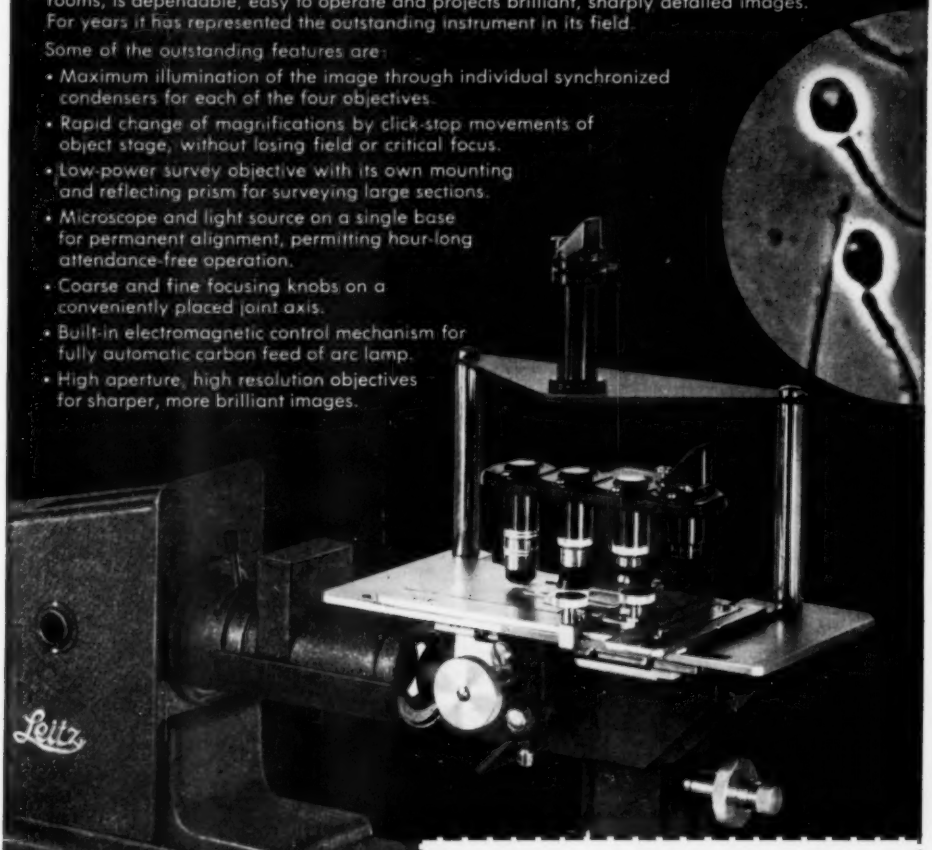

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Spongy, swollen gums symptomatic of scurvy.

From these studies* of dietary habits and physical conditions there is considerable proof that many of the children and adults covered by the surveys have actual, physical symptoms of vitamin C deficiency.

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Symptoms of infantile scurvy are fretfulness and fear of being touched.

These bottle-fed infants, unless receiving a pediatric prescription containing vitamin C, are largely dependent on supplemental ascorbic acid which they receive from fruit or vegetable juices. Unless fortified with vitamin C many of the processed juices may not supply these babies with adequate quantities of this essential element.

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Typical position of legs in infantile scurvy.

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American Journal of

PUBLIC HEALTH

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Official Monthly Publication of the American Public Health Association, Inc.

Volume 46 October, 1956 Number 10

Yellow Fever in Central America: The Imminent Threat to Mexico and the United States

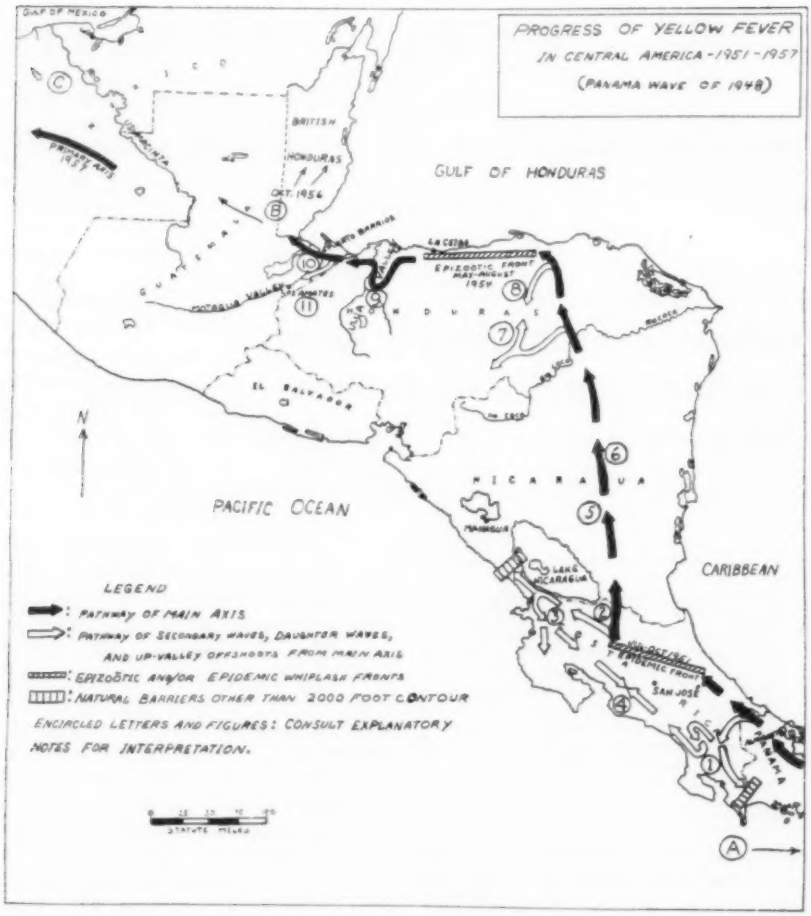
COLONEL NORMAN W. ELTON, MC, AUS, F.A.P.H.A.

Here is a forceful and salutary reminder of the fragility of our vaunted protective measures. We are given to assuming that yellow fever is the least of our epidemic hazards. This account will help to shake that comfortable assumption. Indeed, it is possible that before this paper appears in print a significant flare-up will have occurred.

The invasion of northern Guatemala by the wave of yellow fever that has been moving northward from Panama since 1948 has been confirmed by the finding of the typical histologic lesion in the livers of two dead monkeys. Dr. Carl M. Johnson, director of Gorgas Memorial Laboratory in Panama City, acquired these specimens in February, 1956, from the vicinity of Virginia in the Motagua Valley, Department of Izabal. The livers of two other dead monkeys also obtained in February, 1956, about 130 miles to the east in the vicinity of Esparta, Department of Atlantida, Honduras, located east of the Ulua Valley, were also found positive histologically. Since there was an epizootic reported in the Esparta region from May to September, 1954, confirmed as due to yellow fever by liver examinations in September (two dead monkeys from La Masica), it appears that an enzootic focus has developed in the latter region. This will require surveillance until it dies out.

The published forecast of the anticipated progress of yellow fever in Guatemala and Mexico during the years 1955–1959 [19] had predicted this Motagua Valley outbreak to be expected in July, 1955. Epizootic activity has now taken place in the designated locality, but three to four months later than was anticipated. Because of the quiescence that prevailed throughout the year 1955, it was even suspected that the wave might have undergone a natural death. However, as was pointed out in the December, 1955, issue of Tropical

Colonel Elton is commanding officer, First Army Area Medical Laboratory, New York, N. Y.



Explanation of Map

(Letters and numerals circled on map)

A—Wave originated in 1948 from eastern Panama, where the region generally east of the mouth of the Bayano River is a known extension of the Amazonian reservoir of yellow fever. This enzootic area remains active today and it would be hazardous to enter it without prior vaccination.

B and C—The locale of the present front of the main axis is somewhere in the Departments of Peten and Alta Verapaz in northern Guatemala and ballooning into British Honduras (Belice) (B). Overt epizootic activity, with some degree of epidemic activity may be expected here before the end of October, 1956. The primary axis will probably move northwestward down the valley of the Usumacinta River toward the Gulf State of Tabasco and swing westward through Chiapas to the State of Vera Cruz in Mexico. The rain-forest of the States of Chiapas and Tabasco will probably be overtly involved during the period July–October, 1957 (C).

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1. As the main axis moved northwestward on the Atlantic side of Costa Rica early in 1951, a break-through to the southwest occurred, crossing the cordillera at the site of

Medicine and Hygiene News,[20] a remote possibility still existed of a reversion of the epidemiologic pattern to that of the initial outbreak in eastern Panama in November and December, 1948, and the wave should not be considered dead unless the months of November and December, 1955, passed uneventfully. Not until February 9, 1956, as announced by the Director of the Pan American Sanitary Bureau, in the New York Times on February 12, 1956, was it generally realized that monkeys had died in an epizootic of yellow fever in the lower part of the Motagua Valley in the vicinity of Puerto Barrios, Guatemala, in October, November, and December, 1955.[31]

It is quite obvious that the involvement of the Motagua Valley in the vicinity of Los Amates (Virginia is located only 17 miles northeast of Los Amates) has been delayed. A factor of uncertainty was recognized in the prediction for Guatemala and Mexico because of the prevention of epidemic outbreaks by efficient vaccination programs, and the progress of the wave from that point on was predicated on what happened at Los Amates, and when. This is not the first occasion on which a review of the evidence has been required to account for apparent deviations from the timetable and to make suitable corrections. Not until the involvement of Costa Rica in 1951 was it possible to reexamine the episode of the crossing of the Panama Canal and more accurately trace the probable pathway of the main axis of the wave in its

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2. Following the cessation of activity in the great Costa Rican epidemic front about the middle of October, 1951, an epizootic daughter wave split off from the main axis and headed for the Isthmus of Rivas west of the Great Lake of Nicaragua. Here, it turned around Orosí Volcano at a low point in the mountain range and swung southeastward down the Pacific side of Costa Rica (3) dying out in the Tarcoles Valley (4).

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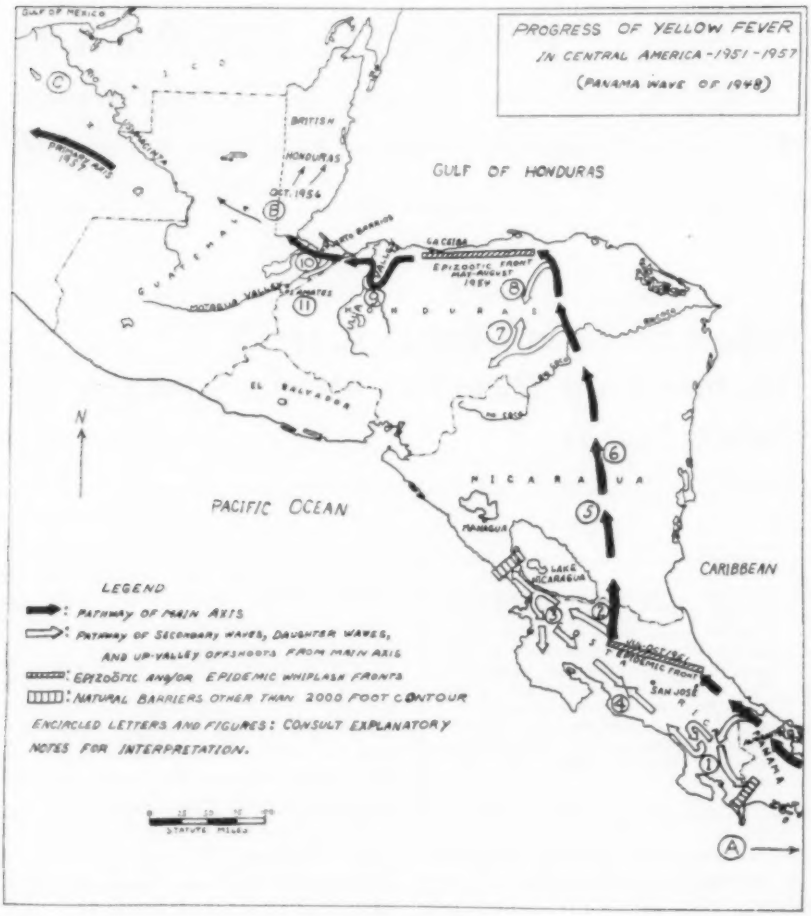
7. Offshoot up valley of the Patuca, Guayumbre, and Guayape rivers with epizootic and epidemic activity in January, 1954. Howling monkeys of the Coco Valley were annihilated.

8. Offshoot up the valley of the Sico River, causing an epizootic episode near Gualaco in July, 1954. In the meanwhile, the main axis had swung to the west along the coast of northern Honduras, developing a whiplash epizootic front approximately 100 miles in length extending from Durango and Tocoa on the east, to Yaruca, San Francisco, Esparta, and La Masica at its western end. This front flared from May to August, 1954. Only one human fatality occurred, probably due to an infection acquired in the western part of the front, in September, 1954.

9. This is the partially deforested Ulua Valley, which was struck by hurricane "Gilda" in September, 1954. It is assumed that the wave encircled the valley resulting in delaying its advance somewhat.

10. Epizootic activity in vicinity of Puerto Barrios from October to December, 1955.

11. Los Amates in the Motagua Valley, the arbitrarily chosen focal point for a forecast for northern Guatemala, British Honduras, and Mexico, was the site of a proved epizootic in April or May, 1955. Since this is obviously an up-valley offshoot of the main axis, the primary front is now undoubtedly infiltrating British Honduras and the Department of Alta Verapaz in northern Guatemala with its strategic component (primary axis) moving westward, heading for the west side of the valley of the Usumacinta River. In ancient Mayan history the months of August and October have been the periods of "sudden death while in full vigor" or "great mortality among the people."



Explanation of Map

(Letters and numerals circled on map)

A—Wave originated in 1948 from eastern Panama, where the region generally east of the mouth of the Bayano River is a known extension of the Amazonian reservoir of yellow fever. This enzootic area remains active today and it would be hazardous to enter it without prior vaccination.

B and C—The locale of the present front of the main axis is somewhere in the Departments of Peten and Alta Verapaz in northern Guatemala and ballooning into British Honduras (Belice) (B). Overt epizootic activity, with some degree of epidemic activity may be expected here before the end of October, 1956. The primary axis will probably move northwestward down the valley of the Usumacinta River toward the Gulf State of Tabasco and swing westward through Chiapas to the State of Vera Cruz in Mexico. The rain-forest of the States of Chiapas and Tabasco will probably be overtly involved during the period July–October, 1957 (C).

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1. As the main axis moved northwestward on the Atlantic side of Costa Rica early in 1951, a break-through to the southwest occurred, crossing the cordillera at the site of

Medicine and Hygiene News,[20] a remote possibility still existed of a reversion of the epidemiologic pattern to that of the initial outbreak in eastern Panama in November and December, 1948, and the wave should not be considered dead unless the months of November and December, 1955, passed uneventfully. Not until February 9, 1956, as announced by the Director of the Pan American Sanitary Bureau, in the New York Times on February 12, 1956, was it generally realized that monkeys had died in an epizootic of yellow fever in the lower part of the Motagua Valley in the vicinity of Puerto Barrios, Guatemala, in October, November, and December, 1955.[21]

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movement around the Chagres (Gatun) watershed.[11]

A somewhat similar phenomenon, involving the circling of the inside of El General Valley, also occurred west of Potrero Grande on the Pacific side of southern Costa Rica. This accounted for the delay in the progress of the northwestern spur of the secondary wave that originated there in October, 1951, and did not terminate in its advance up the Pacific coast of Costa Rica until it burned out in March, 1953, in the Tarcoles Valley west of San José. Here, there occurred a head-on collision with the southeast spur of a daughter wave, derived from the splitting of the main axis by the Great Lake of Nicaragua, that came sweeping down the Pacific coast from the Isthmus of Rivas.

The delay in the recent Motagua Valley outbreak can probably be accounted for by deforestation of the Ulua Valley in northwestern Honduras. Evidently the wave could not cross the valley without following a circuitous detour around the inside rim of remaining forest at an optimum elevation until it found a jumping point close enough to the western side for its continuation onward. In this way the valley delayed the wave by acting as an imperfect or retarding barrier zone. The behavior of the wave in crossing valleys appears to depend largely upon the pattern of forest continuity.

Although the main axis of the wave has exhibited a tendency to follow the 1,000-foot contour, it has on several occasions shown epizootic or epidemic activity in coastal forests at or near sea level where mountains lie close to the shore line, as at Nievecita, at Moín, and at La Uvita in Costa Rica. There appears to be no significant minimum elevation for the transmission of the main axis or spurs of daughter or secondary waves through such forested terrain funnels, although the broad downward sweeps from critical fronts that develop somewhere just below the 2,000-foot contour do not always reach the shore line on extensive forested plains or, at least, do not do so in a recognizable manner. The lower part of the Ulua Valley is said to consist of an open swampland below the banana plantations of the United Fruit Company, across which it would be unusual for the wave to advance.

It is now considered likely that the epidemiologic pattern of the wave has not undergone any significant modification with the possible exception of the establishment of a temporary enzootic focus in the vicinity of Esparta in Honduras, east of the Ulua Valley, and that its estimated over-all velocity will remain at 13 miles per month.[15–17, 19] It is probable that the advance through Guatemala and Mexico will continue in an orderly manner as expected, three to four months behind schedule, but still oriented to the established "After Amates" bands originally described.[19] Furthermore, it is possible that the forecast for Mexico as already outlined, with involvement of the Gulf coast forest of Tabasco next year, will remain a close approximation of anticipated progress. The Motagua Valley invasion obviously constitutes an offshoot of the main axis, now well on its way in a silent phase into British Honduras and Alta Verapaz. Thus one miscalculation may prove to have been offset by another. At any rate, the forecast should be considered valid until further convincing evidence necessitates revision. The establishment of transient enzootic foci in the wake of the wave, such as the residual activity now of some 26 months' duration among the arboreal primates at Esparta, may become a more frequent occurrence from now on. It is not, however, an unforeseen phenomenon, for comments have already been made on

this possibility.[15, 16, 18] A similar situation of several months' duration was reported to have existed in the vicinity of Almirante in Panama in 1951, although pathologic confirmation was not obtained.*

Although the apparent delay is a fortuitous gift from nature, the threat of urbanization of the virus to the Gulf settlements of Mexico and the United States is now imminent, and the time for preparatory countermeasures is at hand. The first step in such counteraction might consist of aerial surveys of the forests of the Departments of Alta Verapaz, Baja Verapaz, and Peten in Guatemala, of British Honduras, and of the States of Chiapas, Tabasco, Vera Cruz, Campeche, Quintana Roo and southeastern Oaxaca in Mexico to corroborate current topographic knowledge and for the purpose of making as accurate an estimate of the probable future movement of the wave as is humanly possible, based upon the concept of a continuation of its epidemiologic pattern as now understood. Another highly important study would involve a careful review and reevaluation of all historic source material concerning the records of epidemics in pre-Columbian times in the ancient Mayan and Aztec empires. The Books of Chilam Balam, for example, consistently refer to a scourge known as xe-kik (bloody vomit) that ravaged the Mayan domain in 1484 and which must have been yellow fever in its pure sylvan form.

Definitive control measures to protect the United States are already assured by the Public Health Service. Although the entire southern part of the United States has been recognized as a "yellow fever receptive" area, the degree to which this region is receptive can hardly be considered comparable to what prevailed in the nineteenth century, or up to 1905, when the last North American epidemic (exclusive of Mexico) occurred in New Orleans and was brought under control by an on-the-spot anti-Aedes aegypti campaign.

It is even possible that if no additional precautions were taken, other than those now in effect under International Sanitary Regulations, the threat to the United States might involve only a minor calculated risk. However, the history of yellow fever during the era of urbanization (1648–1905) is replete with periodic pandemics known as "yellow fever years," evidently due to climatic changes inducing sudden increases in the aegypti population and the extent of its geographic distribution. Should such a cyclic phenomenon occur in 1957–1960 when the rain forest of the Gulf Coast of Mexico becomes involved, then the danger of urbanization of the virus to centers of population in Mexico and the southern United States would be markedly increased and an all-out and timely Aedes aegypti eradication campaign would be fully justified. However secure we may consider ourselves behind our sanitary defenses, unanticipated contingencies could arise, especially with a virus as notorious in its capriciousness as that of yellow fever. For our benefit, as well as that of our neighbor countries, it is always advisable to keep our own housekeeping in good order.

Leaving the matter of the advisability and timing of an Aedes aegypti eradication program for the United States and Mexico to be evaluated independently by the agencies properly concerned therewith, the following supplemental measures are recommended for consideration:

Maintenance of continuous close contact with the wave front as its main axis advances northwestward down the valley of the Usumacinta River in Mexico

* Rather than recapitulate all that has already been reported in the medical literature concerning the contemporary activity of yellow fever in Panama and Central America, a list of current references is appended.

toward the Gulf coastal forests of the States of Tabasco and Vera Cruz. During this further "wait and see" period (1956–1957) Aedes aegypti surveys in critical urban centers would be timely and are already being carried out.

Compulsory vaccination of the crews of all shrimping and fishing boats and coastal vessels operating in the Gulf of Mexico before July, 1957.

Imposition of no restrictions on tourist travel or commerce to or from future "risk areas" or zones of activity in Mexico other than the usual measures and vaccinations, including vaccination against yellow fever.

Authorization of coroners and medical examiners in Mexico and the United States to perform complete autopsies on all persons dying after febrile illnesses of short duration.

Promotion of all feasible research on the epidemiology of this contemporary phenomenon, for there is still much that is unknown. Particularly menacing and poorly understood are the whiplash epidemic and epizootic outbreaks that may develop "fronts" up to 100 miles in length, as occurred in northern Costa Rica in 1951, in northern Honduras in 1954, and which could again occur in Mexico.

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A Big Day in Mexico

"Yesterday may turn out to have been one of the really big days in Mexican history. It marked the official opening of a 'five-year plan.' But this plan is somewhat different from others that have borne that label. It is a concerted drive to wipe out malaria in our southern neighbor.

"Mexico herself will carry the largest single item of the expense in a multi-million-dollar campaign. But she will be substantially assisted by the United Nations Children's Emergency Fund, the World Health Organization and the United States International Cooperation Administration. This is truly cooperative effort in which there is ample room for all to share.

"The malarial picture in Mexico has been bad for many years. Some specialists have called it the worst in this hemisphere. Death rates have not been abnormally high, but incidence has been so great that in many parts of the country malaria is classed as endemic. This means a loss in vitality in the whole population, a low level of human productivity and a consistent susceptibility to other diseases which may become epidemic.

"Fortunately, something can be done about it and Mexico proposes to do it. Residual spraying against mosquitoes will start in something like 700,000 houses. At the same time there will be greatly increased measures of treatment for those who are already infected. There will be survey and evaluation.

"What this really means is that Mexicans in every part of the country will be made to realize, dramatically, the nature of their dreaded enemy. It is a program of education in action as well as of action itself. Mexico deserves warm congratulation on taking these steps. The participating organizations deserve enthusiastic support."

(This editorial was published in the New York Times, September 8, 1956.)

The Public Health Implications of Radioactive Fallout in Water Supplies

HAROLD ALLEN THOMAS, JR., S.D.

There is a tendency for some of us who are concerned with protection of potable water supplies to attach more sanctity to the standards of maximum permissible concentration of radioactivity than present knowledge would seem to warrant. In this paper the assumption underlying the current standards are elucidated. For convenient reference a mathematical model is offered in an appendix to the paper.

An investigation of radioactive fallout from nuclear weapons tests was conducted at Harvard University from 1952 to 1955 in connection with a research program sponsored by the Reactor Development Division of the U. S. Atomic Energy Commission. In this study several thousand samples of rain and stream water, collected at regular intervals in eastern Massachusetts, were assayed for radioactivity.[1, 2] In addition several series of soil samples were analyzed before and after periods of weapons-testing. Of particular interest were the results obtained from a number of groups of water samples collected at various stages of treatment of three rapid sand filtration plants.[3]

The general procedure with water samples in the laboratory was to evaporate one-liter volumes and to measure the gross beta activity in the residue (10 to 400 milligrams) in metal cup-planchets using thin end-window G-M counters. Corrections for geometry, backscatter and self-absorption were made as determined from calibration tests with five pure radioisotopes of different energy-levels, the disintegration rates of these isotopes having been established by the National Bureau of Standards. In addition, some of the samples were analyzed for radiostrontium 90 using specially developed methods of radiochemical analysis.[4]

Fission Products—Production and Decay

When the nucleus of uranium (U^{235}) or plutonium (Pu^{239}) is split by a neutron in the fission process, two fragments are produced. At the same time there is a release of energy and free neutrons that carry forward the chain reaction.

A large number of sizes of nuclear fragments are produced in an atomic explosion. Most fragments are unstable radioactive nuclides that decay into more stable forms with the emanation of various types of radiant energy. A typical primary fission fragment undergoes three or four beta-emitting disintegrations before attaining a stable form.

In Table 1 are presented the salient characteristics of several long-lived fission products that are of particular interest from the public health viewpoint. The figures in column 2 of Table 1 indicate the approximate proportion of the fissions (from the capture of slow neutrons) that yield fragments of the mass numbers listed. For example, in the detonation of the "nominal" bomb (20 kilo tons TNT equivalent) of uranium (U^{235}) or plutonium (Pu^{239}), the fission of one kilogram of fissionable material would produce roughly

Table 1—Significant Fission Products *

Isotope	Yield Per cent	Half Life	Radiation, mev		Maximum Permissible Concentration in Drinking Water † μc/ml
			Beta	Gamma	
Strontium^{89}	4.5	53 d	1.46	None	7×10^{-5}
—Strontium^{90}	5.3	25 yr	0.54	None	8×10^{-7}
→Yttrium^{90}		62 hr	2.18	None	
Yttrium^{91}	5.4	57 d	1.53	None	0.2
—Zirconium^{95}		65 d	0.39 (98%) 1.0 (2%)	0.73 (93%) 0.23 (93%) 0.92 (7%)	
	6.4				
→Niobium^{95}		35 d	0.15	0.76	4×10^{-3}
Technetium^{99}	6.2	1×10^{6} yr	0.3	None	
—Ruthenium^{106}		1 yr	0.03	None	0.1
→Rhodium^{106}	0.5	30 sec	3.5 (82%) 2.3 (18%)	0.5 (17%) 0.73 (17%) 1.2 (1%)	
—Cesium^{137}		33 yr	0.5 (95%) 1.19 (5%)	None	1.5×10^{-3}
	6.2				
→Barium^{137}		2.6 mo	None	0.66	
—Cerium^{144}	5.3	290 d	0.35	None	4×10^{-2}
→Praesodynium^{144}		17.5 mo	3.0	0.2, 1.2	
Promethium^{147}	2.6	4.0 yr	0.22	None	1

* Arrow indicates decay to a radioactive daughter.
† Reference 5.

53 grams (0.053x1,000) of long-lived radiostrontium (Sr^{90}) with an activity of 1.06×10^{4} curies or 3.9×10^{14} disintegrations per second. This amount of activity of the single product Sr^{90} alone is more than a hundred times larger than the original activity in one kilogram of Pu^{239} (62 curies).

The total fission product activity at one hour after the detonation of a nominal atomic bomb is 6×10^{9} curies.[6] The over-all decay proceeds rapidly and may be formulated approximately by the so-called "1.2 law": $A_t = A_1 t^{-1.2}$, where A_t is the activity of the products at any time t after detonation, and A_1 is the activity at unit time. Thus at six

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months (4,320 hours) after detonation, the residual fission product activity would be $6x10^9x4{,}320^{-1.2} = 2.6x10^5$ curies. During this time, however, the activity of long-lived isotopes such as Sr^{90} ($1.06x10^4$ curies) would remain essentially constant and would constitute a large portion of the remaining total activity.

Biological Effects of Atomic Energy

The radiations of concern in fallout are gamma rays, alpha and beta particles. The effects may be due to external or internal radiation. In the control of water-borne radioactive material, the primary interest is in internal radiation. If the water activity level were sufficiently high to constitute a hazard from external radiation then the source would manifestly be unsuitable for drinking.

The effect of all rays or particles on living cells is that of "ionization." A ray or particle strikes an atom within the cell, breaks off a negative electron, and leaves a positively charged atom (or radical). It is in the formation of such "ion pairs" that biologic changes and damage are produced in the cell.

In internal radiation the radioactive material may be taken into the body by ingestion and deposited in various organs depending upon the chemical species involved. Strontium and niobium, for example, are deposited in the bones near the marrow; ruthenium and technetium concentrate in the kidneys. Once deposited in the tissue the activity is subject to removal by natural displacement and excretion and to nuclear decay. In some tissues, such as the bone, the displacement rate may be exceedingly slow and if the isotope is long-lived it remains a constant source of radiation bombardment within the individual.

Practically all radiation effects are injurious. Some kinds of tissue such as the blood-forming elements tend to recover at a rate depending on the dose absorbed. Above a certain critical limiting rate of absorption the cell will die. Certain types of tissue (muscle, brain, and eye) cannot regenerate; repair results only in scar formation. In a broad sense a living cell may be affected by radiation in three different ways: with intensive bombardment it may disintegrate completely; at lower levels of radiation it may escape visible damage but be made incapable of dividing to form daughter cells; at still lower levels there exists a small but finite probability that a structural change in the chromosomes or the cytoplasm of the cell will occur. Such alterations may result in malignant cancerous growth or in the case of male or female reproductive cells, in mutations in the offspring.

Clinical experience, principally as a result of accidents with x-ray and radium, has indicated a level of radiation that is considered safe to absorb over a long period [5]; this level is currently set at 0.3 roentgens per week of gamma or an equivalent amount of beta (0.3 roentgen equivalent physical (rep) per week) ionizing radiations.* A roentgen in this connection may be conceived of as an amount of gamma radiation that produces 2×10^9 ion pairs in a cubic centimeter of air. It is pertinent to note the 0.3 r/wk level is considered by many radiologists to have little if any safety factor. The U. S. Atomic Energy Commission has recently promulgated standards for protection against radiation arising out of activities under licenses issued by the AEC that are based upon a radiation level of 10 per cent of the foregoing figure (0.03 r/wk).[8]

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* Alpha particles, which have a relatively large mass, are considered to be 20 times as damaging on an energy absorption basis as beta or gamma radiation because of their high specific ionization (0.015 rep/wk).

Some insight into the rationale of current standards pertaining to maximum permissible concentration of radioactive isotopes in drinking water may be obtained by consideration of the mathematical model shown in Appendix A. The model simulates some of the characteristic features of isotope uptake and decay in vital organs of human beings and animals.

While the use of the formulation set forth in Appendix A leads to quantitative results for limiting concentrations, it must be realized that a number of rather arbitrary assumptions are entailed. These are chiefly resident in the concepts of, and the numerical values assigned to the permissible weekly dosage, W, the biological half-life, T_b, and the distribution factor, f_w. The MPC values will doubtlessly be subjected to considerable revision in the future as more extensive experimental evidence becomes available. The rate at which this refinement proceeds will in part be dependent upon the frequency of accidents involving overexposure. At present, the critical values such as those listed in the last column of Table 1 must be regarded as the best obtainable under the circumstances, and many of them may prove to incorporate little, if any, safety factor.

The formulation applies to steady state contamination of drinking water with radioactive isotopes. Various unsteady state formulations have been used that are of a form more immediately applicable to evaluation of the hazard from radioactive fallout.[11] As an operational guide in continental weapons tests, the AEC has used the following criterion: to determine whether the concentration of radioactivity in water is below the dangerous level for drinking, the observed activity level is extrapolated to the value it would have at three days after fission by the "1.2 decay law"; if the extrapolated value is less than 0.005 microcuries per milliliter the water may be safely used for any length of time, provided the water has not been contaminated by antecedent detonations and is isolated from subsequent fallout.

Fallout Mechanism

Following the detonation of a nuclear device a large mass of hot gas and pulverized debris is carried upward, sometimes to more than 80,000 feet. When the detonation takes place near the ground a large amount of soil and vaporized building material may be included in the rising mass. Vaporized radioactive material released by the explosion condenses on small particulate material present, and ultimately falls back to the earth as dust. Radioactive fallout has a physical appearance similar to ordinary dust of the same particle size. Where and when it falls depends upon the prevailing air mass movement and precipitation. Air masses that pass over Nevada may arrive over New England in 1.5 to five days. It was found that significant increases in activity in Massachusetts streams occurred only when precipitation took place through the radioactive air mass. For example, during the period from November, 1951, to June, 1953, a period in which there were about 24 detonations, only five were followed by a fallout in Massachusetts extensive enough to raise the radioactivity of surface waters significantly above natural levels.

In general there are three components of radioactive fallout from atomic explosions: (a) particles created by the fission process; (b) particles having induced activity from the neutrons released during the explosion; and (c) the unfissioned, alpha-emitting material of the bomb itself. The measurements by the Harvard project indicated that for long-range fallout most of the activity derived from the fission products (a), and that, normally, induced activ-

ity and alpha emission accounted for a negligible proportion of the total.

Fallout Measurements

In Figure 1 is shown the results of tests [1] for total beta activity in the waters of 14 streams and reservoirs in Massachusetts during the period April–October, 1952. For ease of reference detonation dates and rainfall records are included in the graph. The plotted points pertain to the date the sample was counted, usually from two to four days after collection. The highest levels were observed on June 11, 1952, and were probably caused by the detonation of June 1, 1952. Rainfall occurred in Massachusetts on June 2, 4, and 5, 1952. Curve A of Figure 1 represents the maximum, Curve C the minimum, and Curve B the average count rate for the 14 stations. The maximum rate observed in any sample was about 70 cpm/liter or about $3x10^{-7}$ microcuries per milliliter of total beta activity at three days after fission. This represents 0.006 per cent ($3x10^{-7}/5x10^{-3}$) of the concentration, 0.005 μc/ml, which is the upper limit for potable water according to the AEC operational guide previously mentioned.

Of particular interest is the rate of disappearance of activity in the streams after the passage of the peak. The streams required about one month to recede to natural background levels. A hyperbolic equation, $A = 1{,}300t^{-1.76}$ in which A is the total beta-activity and t the time from the detonation date, was found to fit the data fairly closely. It is significant to note that the exponent of this equation, -1.76 is smaller than -1.2, and the fallout disappeared in the streams more rapidly than may be accounted for by nuclear decay alone. This indicates the effect of deposition and absorption and dilution by subsequent rainfall and groundwater.

Figure 2 shows the effect of the fallout from the April 6, 1953, detonation on the radioactivity in the flow at vari-

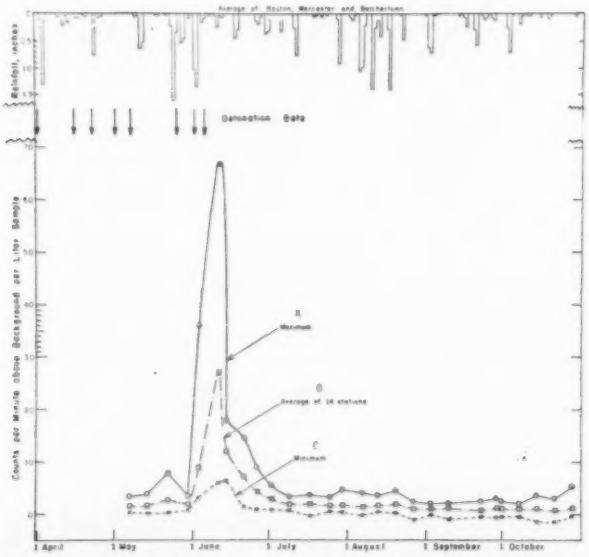

Figure 1—Radioactivity Measurements in Massachusetts Surface Waters, 1952

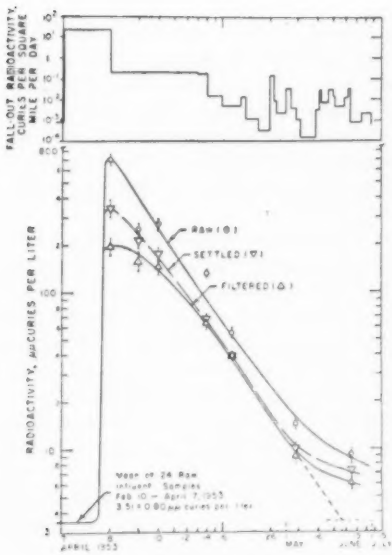

Figure 2—Radioactivity Curve, Cambridge, Mass.

ous stages of the Cambridge municipal rapid sand filter water.[3] The data are plotted on logarithmic scales so that in accordance with the hyperbolic formulation, the decay trends are approximately linearized. At the top of Figure 2 is the estimated fallout in curies per square mile. The largest portion of the fallout occurred on April 7; the travel time of the air mass from Nevada was approximately 40 hours. The filter plant removed about 50 per cent of the activity, with most of the removal occurring in the coagulation-sedimentation units. The activity in the plant influent returned to natural levels after about a two-month period. In comparing the effluent activity of the plant with the value of 0.005 μc/ml at three days (AEC operational guide), it was estimated that the fallout concentration could have been 29,000 times larger than it actually was before the safe upper limit would be reached.

The watershed of the Lawrence, Mass., plant also received a large fallout on April 7–8, 1953. The activity in the raw water at this plant was more than ten times that of the Cambridge plant. The removal of activity in the Lawrence plant during the two-week period following April 7, 1953, amounted to 55 per cent. In Figure 3 are shown decay curves for a set of samples collected on April 9, 1953, at various stages of the treatment process. These decay curves exhibit similar slopes; this would indicate that little if any elemental separation (preferential removal of individual isotopes) was effected in the treatment process. The sample from the open, 42 million gallon, distribution reservoir showed a higher concentration of radioactivity than the plant effluent—a result of considerable interest from the viewpoint of civilian defense. The safety factor for

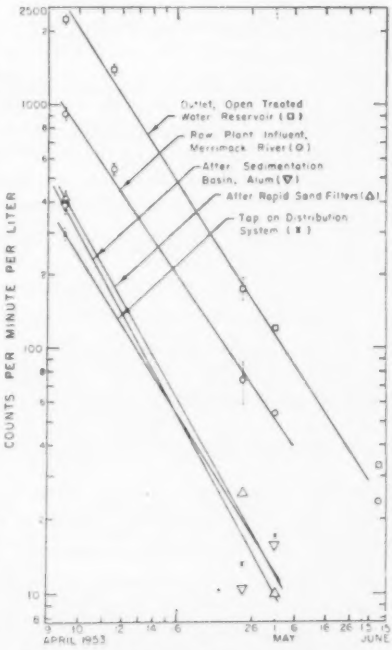
COUNTS PER MINUTE PER LITER
Outlet, Open Treated Water Reservoir (□)
Raw Plant Influent, Merrimack River (○)
After Sedimentation Basin, Alum (▽)
After Rapid Sand Filters (△)
Top on Distribution System (x)
APRIL 1953
MAY
JUNE

Figure 3—Decay Curves, Lawrence, Mass., April–June, 1953

the effluent of the Lawrence plant relative to the AEC operational guide (0.005 μc/ml at three days) was calculated to be from 1,500 to 2,000.

In Figure 4 is a survey plot prepared by Dr. C. G. Bell, Jr.,[2] showing the effect of nuclear detonations on the surface waters of eastern Massachusetts during 1953 and 1954. This plot relates the detonation dates with (1) precipitation at Cambridge; (2) fallout activity concentration measured at Cambridge; (3) the average concentration of radioactivity in the surface waters at 14 sampling stations of the collection area in eastern Massachusetts; (4) the areal rate of deposition of activity at Cambridge; and (5) the areal "runoff" of fallout activity from watersheds in the sampling area.

The plot of the logarithm of activity concentration in the rainfall includes all precipitations from May 12, 1952, through December 31, 1953. The plotted value pertains to the activity measured at the time of first counting which was from one to three days after the rainfall.

It is evident from Figure 4 that many of the detonations caused no deposition in eastern Massachusetts within the sensitivity of the method of detection. This may be accounted for (1) by the absence of precipitation while the radioactive air mass was over Massachusetts; (2) by a path line of the air mass from Nevada that passed to the north or south of Massachusetts; and (3) by previous rainout before the air mass reached Massachusetts. For a total of

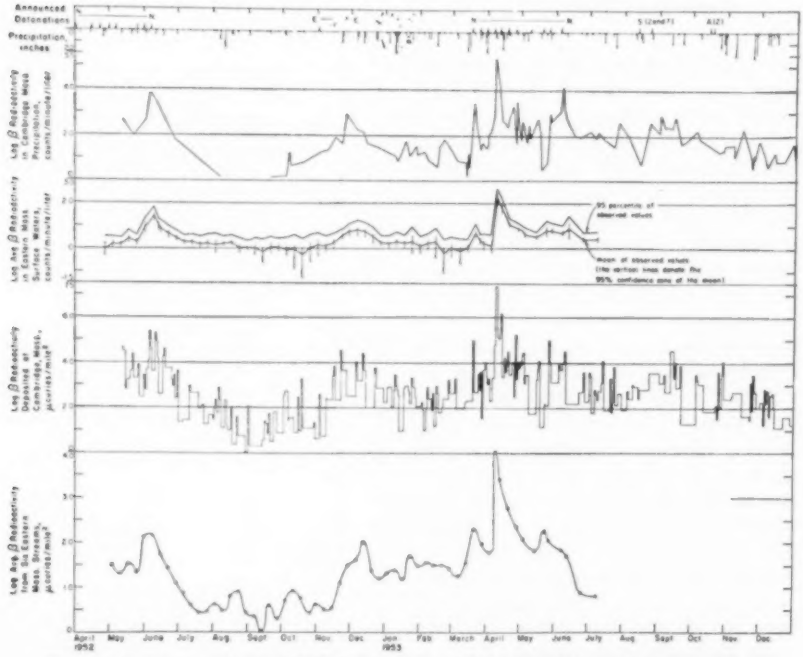

Figure 4—Comparison of *B* Radioactivity of Eastern Massachusetts Rains, Surface Waters, Activity Deposited, and Activity Runoff

22 detonations only seven significant well defined peaks in rainfall activity concentration were observed.

Two graphs are shown for the beta activity in surface waters. The data were obtained from samples collected at weekly intervals at 14 sampling stations. The lower graph indicates the arithmetic mean activity at the time of first counting, which was usually 72 hours subsequent to collection. The upper graph indicates the upper 95 per cent confidence limit for the mean count rate. It may be observed from Figure 4 that during fallout periods the surface water concentration of activity was generally one to two orders of magnitude less than that in the rainfall. The difference is to be attributed in part to the dilution of the rainfall with uncontaminated stream water and in part to the absorption and decay of activity on the land surface during the runoff process.

The lower two graphs indicate the areal concentration of the activity deposited and that found in the runoff. These data, together with similar data for the Genesee River near Rochester, N. Y., give an estimated over-all value of the "runoff coefficient of fallout" of the order of one per cent. That is the total activity flux in the streams at the sampling stations amounted to about one per cent of the activity deposited by rain. The reduction is due in part to the hold-back and absorption on land surfaces and in part due to nuclear decay during the time interval between deposition and appearance in the streams.

Health Implications

The foregoing observations are in accord with published estimates by the AEC [9] and by Eisenbud and Harley [10] regarding the cumulative activity since early 1951. The average areal concentration of total fallout activity for the continental United States excluding Nevada as of January 1, 1955, is estimated to be approximately 4,800 dpm/sf. Of this the activity of Sr^{90} amounts to about 8 per cent or 380 dpm/sf.* The latter figure may be compared with a minimum estimate of 10,000 dpm/ sf for Ra^{226} in the upper 12 inches of soil occurring naturally throughout the country. In so far as these two elements are chemically similar, it is evident that the biological effect of fallout strontium is small relative to that of natural radium.

The AEC has estimated [9] an average of 0.1 roentgen per person of radiation from all nuclear detonations to date including tests by the United States, Britain, and Russia. It has been pointed out that this amounts to about one per cent of the average naturally occurring radiation received by a person during a lifetime.

The findings of the Harvard project would support the view of the medical advisers of the AEC that the small additional exposure of the general population of the country from nuclear weapons testing programs in the United States does not constitute a health hazard or seriously affect our inherited genetic constitution.

Appendix A

Mathematical Model of Uptake and Radiation in Human Tissue

The following notation is used:

Q = the steady state rate of flow of blood or lymph through the critical organ or tissue, grams/day

m = mass of the critical organ or tissue, grams

c = the natural concentration of the (stable) element in the critical organ or tissue, grams of element/critical tissue in grams

X_o = the concentration of radioactive element under consideration in the blood delivered to the organ; atoms/gram of blood

* Disintegration per minute per square foot.

X = concentration of radioactive element leaving the organ, atoms/gram of blood

Y_o = the concentration of the stable element of the same chemical species delivered to and removed from the organ in the blood, atoms/gram of blood. It is presumed that $Y_o \gg X_o$

W = the radiation exposure to the critical organ
= 0.3 rep/week for gamma and beta radiation
= 0.015 rep/week for alpha radiation

$\Sigma(bE)$ = the effective energy of radiation per disintegration, in millions of electron volts, mev.

$(MPC)_w$ = the maximum permissible concentration of the isotope in drinking water, microcuries per milliliter.

A = (6.03) (10^{23})/(gram molec. wt. of element).

L = the number of grams of water ingested per day per person.

f_w = the fraction of element ingested that is delivered to the critical organ.

λ = the decay constant of the radioisotope, per day.
= $0.693/T_r$, where T_r is the radioactive half-life in days.

T_b = the biological half-life of the stable element, days.
= (0.693) Acm/QY_o

$T = T_b\ T_r/\ (T_b + T_r)$ = the "effective" half-life of the radioisotope

Assume a steady state with complete mixing and free exchange of both isotopes of the element within the organ so that the distribution is uniform throughout and in dynamic equilibrium with the concentration in the fluid leaving the organ. An activity balance is given in the following equation

$$Q\ (X_o - X) = \lambda\ Acm\ (X/Y_o) \quad (1)$$

$$(X_o - X) = \lambda\ X\ (T_b/0.693) = X(T_b/T_r) \quad (2)$$

or

$$1 - X/X_o = T_b/(T_b + T_r) \quad (3)$$

The radiation damage in the organ depends upon the disintegration rate within the organ, and the energy release per disintegration.

$$W = k_1 m^{-1}\ Q\ (X_o - X)\ \Sigma(bE) \quad (4)$$

where k_1 is a scale factor depending upon the units of measurement used. The amount of active element delivered to the organ in steady state is

$$k_2 L\ (MPC)_w\ f_w = \lambda\ QX_o \quad (5)$$

where k_2 is a scale factor depending on the units employed. Eliminating Q, X, and X_o from equation (4) using equations (3) and (5),

$$W = \frac{k_1\ k_2\ L\ (MPC)_w\ f_w\ T_r\ T_b\ \Sigma(bE)}{0.693\ m(T_b + T_r)} \quad (6)$$

Finally, solving for the maximum permissible concentration of the isotope with appropriate values of the scale factors, and setting $W = 0.3$ rep/week, and L at an average value of 2.2 kilograms per day, the following relationship is obtained:

$$(MPC)_w = \frac{2.34 \times 10^{-7}\ m}{\Sigma(bE)\ T\ f_w} \quad (7)$$

In this steady-state form the formula is equivalent to equation G-6 of Handbook 52 of the National Bureau of Standards [5] and has been used to establish the maximum permissible concentration in drinking water of most of the radioactive fission products (Table 1, last column).

For example, for promethium^{147} the following parometers apply:

$\Sigma(bE) = 0.067$ mev. $m = 7{,}000$ grams (bone);
$T_r = 1.46 \times 10^3$ days; $T_b = 100$ to 150 days; $T = 140$ days;
$f_w = 1.7 \times 10^{-4}$; Substituting these values in equation (7) a value of 1 microcurie per milliliter is obtained.

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Some Mental Health Aspects of Civil Defense for Public Health Workers

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It is with a great deal of satisfaction that the editors open the pages of this Journal to the broadcasting of a most important phase—human behavior phase—of the vital, but much neglected, matter of civil defense.

Many people believe that our nation's potential to resist, to survive, and to fight back is significantly related to the mental healthiness of its people in the face of disaster and attack. Thoughtful civil defense officials are asking: Would our people panic? Would our medical and other resources be overwhelmed by large numbers of psychiatric casualties? Does fear-centered civil defense education contribute to the apathy we see?

The final scientific answers to these and other questions are not all available. More research is certainly needed. On the other hand, we are not completely in ignorance about these problems. The experiences of the English,[1] Germans,[2] and Japanese [3–5] in World War II have been recorded, and studies of people in the face of disaster have been made by American,[6] Canadian,[7] and Netherlands [8] investigators. Out of these and other learnings that have accumulated [9] it is possible to construct some picture of the possible problems that will arise and some common-sense approaches to their prevention or management. The material presented here has been selected and tailored for the use of the public health civil defense workers whose main task will be the health protection of the uninjured survivors. Each of these civil defense workers will need to know how people react to overwhelming stress and what can be done about these reactions to prevent them or manage them.

The Problems We May Face

In brief, people during a future war would be exposed to "long-term stresses" lasting an extended period of time and to acute immediate stresses, like bombing attacks. To these two types of stress there would be individual reactions and mass reactions of groups of people.

A. Long-Term Stress: Psychological Warfare—An enemy can employ specific measures designed to affect the psychological health of our people. Most of us are acquainted with attempts to confuse people by planting rumors. A more subtle device is to demoralize a population through alternate cycles of threat and "giving hope for peace." Other methods include "fanning" up minority group grievances, spreading doubts about leaders, use of the "big lie," news distortion, and seductive nostalgic reassurance ("Tokyo Rose").

The control and management of many of these specific morale-breaking technics is a national intelligence responsibility which will require the complete cooperation of the communications industry. In local settings it will be necessary for civil defense workers to set up a rumor interception and reporting mechanism, as well as effective

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means of communicating with refugees so that rumors can be countered before they spread and affect behavior. Certainly, many of the public health protection measures in an evacuation camp would be lost quickly if the refugees were stampeded into flight by rumors of a biological warfare attack or an impending radiological fallout.

B. Individual Reactions to Immediate Stress—When a bomb bursts or a sudden disaster falls, how do the survivors react? Studies of Japanese reactions to the atomic bombings, British and German analyses of the effect of World War II bombings, as well as other studies of community disasters in Canada, the United States, and Holland give us some clues on this question. Some of the findings of the Canadian group under Tyhurst [7] can be presented in chart form.

An exploration of this chart, which paraphrases the work of Tyhurst and associates, reveals three groupings of people (see last column). Assuming these findings can be applied elsewhere, this would mean the civil defense worker might have 12–25 per cent calm, cool, collected people (Group A) on which he might depend for immediate rescue and other types of work. The Group B of about three-fourths of the population show another kind of "normal reaction" to disasters—bewilderment, lack of awareness of emotions, restriction of attention, signs of fear, and sometimes automatic-like behavior in the period of impact and early recoil. Gradually, during the recoil period, these individuals return to awareness of the immediate past and the disaster they just faced. Emotional expression begins as feelings of anxiety, fear, anger, or laughter appear. They need to talk, to do, to be given something for comfort, such as coffee or a blanket. They need to be with others, to attach themselves in childlike dependence to someone for a short time. Individually most of them return to adequacy over a few hours to several days. Group C, which has been labeled "sick," shows disturbed behavior, such as confusion, paralyzing anxiety, inability to move, hysterical crying, or screaming. It is evident

A Natural History of the Process of Individual Reactions to Disaster

Period *	Amount of Stress	Length of Time	Persons Centered on the	Reactions of Individuals	
Impact period	Very high	Few minutes to one hour	Present	Group	Condition
				A	12–25% cool
				B	75% stunned
				C	12–25% "sick"
Recoil period	Diminishing	Differs in each	Recent past and present	Group	Condition
				A	Group can work
				B	Group recovering, expressing emotions
				C	Group needs care
Post-traumatic period	Social, economic stress rises—grief, loss	Tapers off over rest of life	Present to future	Group	Condition
				A	Group can work
				B	Group mostly recovered
				C	Group needs care

* The periods overlap.

these people will be acute casualties requiring segregation and trained help.

In the posttraumatic period, which may last for some time, some individuals will break down and show anxiety or fatigue states, psychotic episodes, recurrent catastrophic dreaming, or depressive reactions. This latter data from the Canadian group reminds one of the mass delayed reaction that occurred in the evacuation camps following the Galveston flood when one-tenth of those exposed developed some type of behavior breakdown on the tenth day after the disaster.[10]

Although we cannot scientifically predict that all of the above phenomena will take place or in those percentages of the population, the learnings just presented lend us invaluable clues as to the range of problem behavior we may encounter, and for which we must prepare ourselves.

C. Mass Reactions to Overwhelming Stress—In addition to the individual reactions to stress, certain mass behavioral phenomena affecting large numbers of people have been observed and recorded. They have been variously described as panic, apathy, demoralization, anger, rioting, "scapegoating," and loss of group identification. Some of these no doubt are phases or stages of individual reactions present simultaneously in large numbers of the population. Others are genuine contagious group phenomena, products of group interaction.

There has been a great deal of speculation about panic.[6] Predictions have been made that panic or mass hysteria will add devastating disorganization and paralysis to the civil defense problem. In order to bring the elements of truth and experience, some of the findings of the Committee on Disaster Studies of the National Academy of Sciences—National Research Council are quoted:

"Although there has been war somewhere in the world almost continuously during this time, it is a significant and somewhat astonishing fact that there have been few instances of panic directly connected with enemy attack on a civilian population. Studies indicate that panic states are usually of short duration, and that excited and irrational behavior can usually be prevented or quickly brought to a stop if effective leadership and realistic information is provided. A striking finding that emerges from observations in large scale disasters, including the A-bomb attack against Japan and the massive bombing assaults against England and Germany, is that the people who are most frightened and most upset very soon become extremely docile and can easily be induced to conform to the rules and regulations of the local authorities. . . .

"Those who predict that a large number of Americans will react to the threat of an enemy attack by becoming panic-stricken are not basing their opinion on the existing evidence."

Although it appears panic has been overemphasized, it is evident that small instances may occur, especially when a group feels entrapped, or its escape route is blocked, or front-to-rear communication of a column of people breaks down.

If we can judge from records of the German experiences, other mass behavior problems may be faced more frequently. It is likely that public health officials operating in an evacuation area may be exposed to angry scapegoating. Studies in Europe revealed that some of the anger provoked by bombings, which is hard to express directly to the planes of an often unseen and a distant enemy, becomes redirected at local officials. Civil defense leaders are blamed for inadequate protection and facilities, for lack of food, water, housing, and other care. In addition, lack of planning can result in angry aggressive behavior and/or rioting around hospitals and

places where food and water are being distributed. Most of us are also familiar with the looting, the breakdown of moral behavior, and the other asocial behavior that may accompany disasters. Although this is not a complete rendition of mass behavior problems, it gives us clues relative to problems one must anticipate.

What Can Be Done?

The civil defense workers assigned to dealing with the welfare and public health of the survivors will need to mobilize their resources cooperatively to: prevent or minimize behavioral problems; control and manage individual behavior problems; and control and manage mass behavioral reactions. Undoubtedly the knowledge and skills of public health education and the behavioral sciences will have to be welded together to create some form of practical training for all civil defense workers on the mental health aspects of civil defense.

A. Prevention—After reviewing the experiences of the English it is evident that it would be wise to mobilize the mental health, the civil defense, sociological, communications, and other scientific manpower of this country to plan for and develop our psychological strength to resist, to endure the stress. Some of the tools which have been or can be used to strengthen our people are described:

1. The use of positive motivations in civil defense education—Some of the present civil defense courses open with motion pictures of the hydrogen bomb and predictions of casualty lists, and such content is labeled, "motivation." These fear-provoking data certainly motivate some into action, but a good many other people must defend themselves against an overwhelming fear. They may variously defend themselves psychologically from this death threat by the mechanisms of rejection ("Aw, to heck with it!"), denial ("I don't even want to talk about it."), suppression, surrender ("What's the use?"), indifference, apathy, not hearing what is said, or other methods of evasion. Here the motivational units of our training course may be actually contributing to the apathy, to the need to wall off and deny the death threat in some of the very people we hope will be our leaders. Public health workers have seen this same apathy, indifference, or denial in many persons suffering from tuberculosis or cancer.

The English and American literature, in civil defense, health education, and mental health, document the greater wisdom of using positive motivations instead of fear. If education content can derive its personal meaning to the learner from the will to live, instead of the fear of death, it might be possible for more people to safely and actively relate themselves to civil defense education, to hear it and use it, rather than unconsciously or consciously defend themselves against it. Emphasis might well be on how to survive, self-protection, family protection, how to move to the "survival zone," health protection, refugee camp organization, and on planning for family self-sufficiency. By first using the motivations for personal and family survival it will be easier later to create interest in cooperative neighborhood and community civil defense roles. Instead of lectures that mainly vent the motivations of the speakers, courses can be designed so as to involve the learners in participating in working out some of the details of their own personal, family, neighborhood, and community roles in civil defense. These are but a few of the modern education methods that can be used to break the apathy or withdrawal and to tap positive motivations to get involved with civil defense.

2. Self-development by civil defense

groups of their own goals—The value of goal-directed behavior, of established objectives in guiding behavior is well known. Experience has shown various people are motivated by different types of goals. In World War II some responded to "idealistic goals" like the Atlantic Charter, the "Four Freedoms." Others appear to need practical goals such as "saving my house," "protecting my job." Still others find strength from personal goals. "I'm fighting for my family . . . my sweetheart . . . to save my own skin." Despite the fact that national goals and plans must be laid there is still room for each citizen to decide what he wants for himself. The key is in the self-decision. It is the self-decision that uncovers the strong motivations that will keep the individual staying by these goals under stress. This, too, can become a part of civil defense training.

3. Use of "Mutual Help" groups—The mutual support that develops in groups exposed to stress is well known. The development of "mutual help groups" in office buildings and neighborhoods to pool resources and develop plans might not only psychologically strengthen the group members, but also sufficiently reassure a civil defense worker that the neighborhood group will help his wife, so that he can stay on his civil defense job. Having an identification with a group and a group-chosen leader to follow will help meet basic emotional needs in many during crises.

4. Use of "Anticipatory Guidance" principle—Knowledge, ahead of time, of what to expect and alternative ways of meeting the problem is a core part of civil defense education that will prevent some behavior problems. Information about weapons should be immediately followed by concrete data on "What to do, what these weapons cannot do, how to survive attack, defense plans and mutual aid that can be expected." By thus moving from knowledge of the danger to the action response to be made to it, more individuals can be helped to be ready for a crisis.

5. Use of "Planned Desensitization" and "Conditioning"—A needle repeatedly driven into a finger first leads to oversensitivity, then later to numbness or desensitization. For certain groups of civil defense workers, continual talking about and minimal trial exposures to a danger or fearful experience they may face can help to desensitize them to a point where they may be able to function more adequately. It has been suggested that such "desensitization" will create apathy, the contempt of familiarity, unless it is carefully accompanied by "conditioning" in what is the proper action to take. In other terms, the well known value of constant rehearsal, of "fire drills" in cutting down overexcited confused behavior can be mobilized to prepare men to meet stress.

6. Rumor interception and countering—Certainly, early interception and countering of rumors will help to prevent unnecessary individual and group reactions to supposed stresses. It has been suggested that health educators and others could mobilize the youth into a rumor-detecting and reporting corps. Rumors discovered could then be quickly reported to headquarters groups, fed to communication resources, countered with facts and suggested action.

These tools described in no way represent the total resources available for dealing with morale and preserving mental healthiness, while under stress. Since behavior problems, individual and mass, could potentially disrupt the performance of other well planned civil defense activities, consideration should be given to inclusion of experts in the learning processes and the behavior sciences in local civil defense planning and training.

B. The Handling of Individual Reactions—In general the management of

individuals showing disturbed behavior reactions to stress falls into (1) Psychological First Aid Methods [12] and (2) Treatment Methods.

1. Psychological first aid—Perhaps every civil defense worker should receive some basic training in dealing, on a social management level, with the immediate stress reactions. Assuming that we will be faced with groups depicted in the chart above, A—cool, collected, B—stunned and bewildered, and C—psychologically sick people, some logical action suggests itself.

The calm will be needed to work, to rescue, and to help us handle Groups B and C. Tyhurst reports that the stunned and bewildered (Group B) are often in "childlike dependence." They need to be with others, they need to be led, and "they want to be given something—coffee or a blanket—or to be looked after, and the importance of the giving and nursing appears not so much related to the actual kind of aid as to the psychological meaning of being cared for." This suggests leaders from the calm Group A should be used to round up and collect the stunned Group B into small groups. Under firm leadership these people could be grouped, paired off, and moved as a body to a point of safety. By putting them into movement, or at work in some simple task (like gathering wood or digging garbage pits) they can drain off some tension in motor activity. As they return to awareness a permissive and sympathetic attitude that will allow them to talk out, share experiences, ventilate feelings, or have a "good cry" would be helpful.

Nurses, teachers, or mothers, using themselves in a maternal way, could emotionally support such individuals during the return of their feelings. Feelings of guilt, anger, fear, anxiety, and depression can be listened to without any attempt to judge or without any attempts to argue the feelings away. Verbal and nonverbal reflecting, accepting, and recognizing the expressed feelings will help the bewildered person feel he is understood, and thus supported. Providing food, shelter, the support of a group, reunion with friends, and a stable, safe environment will help some, while redirecting anger and anxiety into work channels may be needed for others. Within one to two days the majority of those individuals can be expected to return to adequacy and independence. The task of caring for these stunned, bewildered individuals lies well within the competence of many natural leaders in our population. The task is mobilizing these leaders, giving them minimal training, and then selecting the "naturals" who can spontaneously give this type of emotional support. In addition we must teach other civil defense leaders how to group the bewildered persons and protect them during their recovery.

The planned group management of the stunned and bewildered can free the overloaded medical facilities of a large number of casualties. It is evident, however, that the management of the Group C individuals who are psychologically sick will require treatment facilities.

2. Treatment facilities—Certain individuals, immediately or sometimes later in the posttraumatic period, will suffer behavior disturbances of severe nature.[7, 13] Civil defense workers will need to be alerted to segregate these individuals (so their behavior does not become too socially contagious) and to provide special facilities to deal with these persons. Among these will be the grossly confused, the psychotic, those literally "running away," those paralyzed with anxiety, as well as the hysterical, crying, or screaming patients. Others may be in rages out of control, some acutely depressed. Some individuals will be suffering from the body manifestation of acute tension, such as

headache, dizziness, anxious inability to swallow, hyperventilation (breathing too fast into faints), nausea, the diarrhea of fear, and rapid heart beat and the physical collapse of emotional exhaustion. All civil defense workers must be alerted to the need of these people for special care in aid stations, receiving centers, exhaustion centers, or hospitals. Undoubtedly teams of workers from state hospitals, mental hygiene clinics, and other mental health facilities must be organized to provide the isolation, emotional support, nursing care, medical care, and psychiatric treatment that will be needed. This is an important area of medical care of casualties that merits careful planning and field testing. Such facilities will not only be needed along routes of evacuation, but also near refugee camps.

C. Handling Mass Reactions—The best management of mass reactions, such as panic, rioting, scapegoating, demoralization, and others is prevention. The sanitation personnel who set up a watering point should not only plan to provide safe water, but also plan to manage the behavior of the people there. Roped off aisles of access to spigots, as well as enforcement of taking one's turn in line may prevent crowding, rioting, and subsequent contamination of the water. The redirection of the crowd of people gathered about an aid station, public health unit, headquarters, or food point into work crews to dig privies, or drain camp sites might turn their dependency, anger, griping mischievous idleness into productive work. The panic that might develop in a column of frightened refugees whose flight has been necessarily stopped at a traffic control point could be prevented by one of the traffic control officers going back down the line to communicate the reason for the delay. Through adequate anticipation, planning, and information giving, supplemented by timely redirection of behavior, many types of mass reactions can be prevented.

When mass behavior reactions do occur, firm leadership and decisive action are needed. Police-like action and rapid seizure of the leadership role are often needed to break up riots or panics. Such devices as isolating the leaders and sending flying columns through the group to divide it have succeeded. Traffic control officers may have to redirect a panicky column of people in flight off into a field or side road. Food riots have been broken by redirecting an angry group into physically exhausting themselves running off to another food point. When the usual pleas to wait, to be reasonable, and other intellectual arguments fail to stop the rising contagion of feeling that is characteristic of mobs, the psychological device of substituting a greater threat has been effective. For instance, mobs have been disbanded or redirected by a new leader seizing control and substituting for their anger a greater fear, such as the fear of impending attack, contagion, troops, air raid, etc. The device of admitting beyond a barrier a small committee of a group's main leaders supposedly to confer or investigate is a time-honored technic to sever a group from leadership that is fomenting it into action. Mass reactions of apathy, confusion, bewilderment apparently will respond to efforts to assemble the people, group them and set them in motion, moving toward safety or welfare facilities. The reassurance of being in a group, of being led, of doing something is usually helpful.

It would be probably a wise move to prepare all civil defense workers to expect and deal with "scapegoating." In many of these situations it will be important to reflect the feelings (not argue), to ask, "What do you want done?", and then put the issue, "Will you help us?" In most of the settings where public health workers will be

working there will be an ample surplus of jobs to be done in sanitation, message-carrying, or assisting the helpless, so that it ought to be quite feasible to redirect hostile, griping, or over-anxious individuals into important work. The possibilities of developing local neighborhood self-government groups in refugee camps should be explored. Matters of sanitation, reporting illness, controlling behavior, and organizing help for one another could gradually be assumed by these governing groups.

Summary

Maintaining the mental health, developing morale, preventing personality breakdowns, or providing for the treatment of psychological casualties is a major field of civil defense practice. All civil defense personnel will need to know the elements of psychological first aid and the plans for dealing with the psychologically sick. In addition, it is important for many civil defense workers to find a greater appreciation of the influence that the quality of their leadership, their educational procedures, and their own interpersonal relations have upon the stability and readiness of their colleagues in the face of acute stress.

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Endemic Goiter in Costa Rican School Children

CARLOS PEREZ, M.D.; ALFONSO SALAZAR-BALDIOCEDA, M.D.; OUDH B. TANDON, Ph.D.; and NEVIN S. SCRIMSHAW, Ph.D., M.D., F.A.P.H.A.

The present report from Costa Rica is the last of the series from the member countries of INCAP. It contains references to previous studies, together with further emphasis on the public health importance of adopting prophylactic measures for the control of endemic goiter.

As a result of efforts made by the World Health Organization and its Regional Office for the Americas, the Pan American Sanitary Bureau, special attention has been given to endemic goiter as a health problem in Latin America. In recent years the public health departments of each one of the six countries of Central America and Panama, in cooperation with the Institute of Nutrition of Central America and Panama (INCAP), have conducted surveys to evaluate the importance of endemic goiter in their populations. Reports have been published for El Salvador,[1] Guatemala,[2] Honduras,[3] Nicaragua,[4] and Panama.[5, 6]

These studies have all revealed a relatively high incidence of endemic goiter and have stimulated legislation requiring the compulsory iodization of salt. Laws to this effect have been enacted in Guatemala and Panama and are pending in the other countries. Endemic goiter has been known to exist in Costa Rica for years, although its extent and severity have not previously been determined. Early in 1941 a law requiring the iodization of salt was passed, but to date it has not been enforced.

The present report summarizes the results obtained in the survey of 26,768 school children in all sections of Costa Rica conducted during the years 1952 through 1955.

Materials and Methods

Localities were randomly selected to include the entire country and to represent both the rural and the urban areas in each one of the provinces. According to the census of 1950, the population of Costa Rica * was 800,875; of this total, nearly 232,978 (29.1 per cent) were between seven and 18 years of age. The sample studied was derived from this group.

One or more schools were visited in each locality depending on the size and the homogeneity of its population and the children attending these schools examined. The sample studied represented approximately 11.5 per cent of the total population between seven and 18 years of age.

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* The Republic of Costa Rica, with 51,011 square kilometers, is the second smallest in extent among the countries of Central America and Panama. A cordillera runs through the central part of the country. These highlands have an altitude of approximately 3,000 feet and are densely populated. The rest of the country is low in altitude and is thinly populated. The republic is divided into seven provinces.

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After careful inspection and palpation of the thyroid gland, persons were classified in the following four groups, based on the recommendations made by the Third Conference on Nutrition Problems in Latin America[7]: (0) Persons without goiter—thyroid gland not larger than four to five times the normal volume; (1) persons with palpable goiter—thyroid gland larger than four to five times the normal volume, but not large enough to be classified in Group 2; (2) persons with visible goiter—markedly enlarged thyroid readily visible with the head in semiextended position; and (3) persons with large goiter—greatly enlarged glands readily visible at a distance.

The normal outline of a lateral lobe was considered to be approximately that of the thumbnail of the person being examined. The presence of nodules was recorded and when they were present the goiter was classified as adenomatous.

Results

The distribution of goiter according to sex and age is shown in Table 1. In both age groups the incidence of goiter was slightly higher in females than in males. The incidence of goiter tended to increase with age, as is clearly reflected by the difference in the incidence reported for the two age groups. Nearly all of the goiters recorded were size 1 and very few nodular or adenomatous goiters were found.

Table 1—Endemic Goiter in Costa Rica According to Sex and Age

Sex	Age in Years	No. Examined	Type of Goiter: Diffuse	Type of Goiter: Adenomatous	Incidence Per cent
Female	7–12	10,057	1,200	126	13.2
	13–18	1,503	331	26	23.8
Male	7–12	13,002	1,236	120	10.4
	13–18	2,206	396	31	19.4

Table 2—Geographic Distribution of Endemic Goiter in Costa Rican Children

Province	Population Between 7–18 Years of Age	Incidence of Endemic Goiter Per cent
San José	79,600	12.0
Cartago	30,904	11.9
Heredia	14,955	15.2
Guanacaste	28,309	25.6
Puntarenas	23,838	20.3
Limón	10,279	10.2
Alajuela	45,093	20.4
Over-all total	232,978	16.5 *

* Average weighted for age distribution and proportionate number of persons per province.

The geographic distribution of goiter is shown in Table 2. In all seven provinces the incidence of endemic goiter was over 10 per cent. The highest incidence was found in the province of Guanacaste with 25.6 per cent and the lowest in Limón with 10.2 per cent. At the completion of the survey both the incidence of goiter in a sample of school children of each age group in each province and the total number of school children in each group and province were known. However, the proportion of children examined varied from one province and age group to another and hence the precision of the estimate of the incidence in each province also varied. Taking into consideration these factors, the over-all incidence for the country was calculated to be 16.5 per cent.*

The incidence of goiter corrected for age distribution was found to be 18.4 per cent in 4,797 children in rural

* The procedure followed was that suggested by Cochran[8] and is an example of ratio estimates in stratified random sampling where the provinces form the strata.

localities and 11.4 per cent for 21,971 in urban areas. There was no suggestion of racial difference in the incidence of goiter in the survey findings.

Discussion

The increased incidence of goiter in adolescence should not be interpreted as a normal physiologic phenomenon, since goiter does not ordinarily occur in these persons when the iodine intake is adequate. In the present study the highest incidence of goiter (28.6 per cent) was encountered in 15-year-old girls. An increase in the physiologic demand for iodine in adolescence is probably the chief factor accounting for a corresponding increase in the frequency of goiter, from a low of 6 per cent at seven years of age to one of 18–20 per cent at 13 years. It is obvious that a study based largely on young school children results in a low estimate of the incidence of endemic goiter in the entire population of the country.

Nodular goiters were rarely encountered in this study. In relatively young persons in populations in which the incidence of goiter is only moderately high, diffuse goiter is much more frequently encountered than the nodular type.[1, 3] However, the surveys in Central America have encountered a higher incidence of adenomatous goiter in older age groups where adenomas have had an opportunity to increase in size, particularly in areas where the total incidence of goiter is high.[2]

It is difficult to identify the factors responsible for the higher incidence of goiter in rural areas as compared with the urban ones. However, certain possible goitrogenic factors such as vitamin A deficiency[9, 10] may be involved. Furthermore, diets of persons living in rural areas are generally more monotonous and have a higher proportion of locally grown foods. This reduces the amount of iodine obtained by the rural population through the consumption of foods from nongoitrous areas which are richer in this compound.

It has been suggested that endemic goiter should be considered a serious public health problem when the incidence in a population is revealed by surveys to be above 10 per cent.[7, 11] When this is shown to be the case the iodization of salt for human consumption should be adopted as a prophylactic measure. Since the over-all weighted incidence of endemic goiter in Costa Rica has been found to be over 16.5 per cent in school children, there is no doubt that endemic goiter is an important public health problem.

Analysis of four different samples of salt obtained from Costa Rica has revealed values for their iodine content of approximately 0.04 mg per 10 gm of salt.[12] This corresponds to approximately 1 part of iodine in 250,000 parts of salt, a level very much lower than that of 1 in 10,000 to 1 in 20,000 suggested by the Third Conference on Nutrition Problems in Latin America.[7] On the basis of daily per capita consumption of salt of 10 gm,[13] persons in Costa Rica are receiving in salt only 10 per cent of the amount of iodine recommended.[7]

Whether or not goitrogenic factors are prevalent in Costa Rican environment, it has been definitely shown that the oral administration of iodine, either in the form of potassium iodate or iodide, reduces the incidence of endemic goiter under the conditions prevailing in Central America.[14] Consequently, it is important to stimulate the enforcement of the law approved in 1941 which requires the compulsory iodization of common salt. Since the frequency of goiter was found to be higher than 10 per cent in six out of the seven provinces, it is clear that this measure should apply to all of the salt in the country destined for human consumption.

The use of potassium iodate is recommended in many tropical areas for iodization because of its stability under extremes of moisture and temperature.[7, 11] Since the potassium iodide can be used only to iodize a very dry refined salt distributed in a protected package, potassium iodate will prove more practical for the iodization of salt in Costa Rica.

On the basis of present knowledge of physiologic requirements for iodine, the possible presence of goitrogenic factors and the amounts of iodine already present in most Latin American diets in goitrous areas, the Third Conference on Nutrition Problems in Latin America recommended that the maximum and minimum levels of iodization be 1 part of iodine in 10,000 parts of salt and 1 part in 20,000, respectively.[7] It is suggested that the salt in Costa Rica be iodized in this range.

Summary

A total of 26,768 children were examined in both rural and urban areas of the seven provinces of Costa Rica. The per cent of goiter increased from 11.6 per cent in the seven- to 12-year age group to 21.1 per cent at ages 13 to 18. Females had a consistently higher incidence, but the differences were not statistically significant. The frequency was higher in rural than in urban areas. The lowest incidence in any province was 10.2 per cent and the highest 25.6 per cent. The remaining provinces had averages between 12 and 20 per cent. Goiter with palpable adenomas constituted only 0.8 per cent of the total.

The over-all weighted percentage for the school-age population in the entire country was 16.5 per cent. The error in the estimates of such a figure was not likely to be above 20 per cent. It is concluded that the law requiring the iodization of salt should be enforced. The addition of potassium iodate to salt at a level between 1 part of iodine in 10,000 parts of salt and 1 part in 20,000 is recommended.

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Staphylococcal Disease—An Obstetric, Pediatric, and Community Problem

R. T. RAVENHOLT, M.D., M.P.H., and G. D. LaVECK, M.D.

The caustic observation that a lying-in hospital may be a fine place for the mother, but a hazardous one for the infant finds support here—with the added suggestion that the mother, too, may be at some risk. The authors suggest that the hazard reported upon here is a community health matter, not merely that of individual hospital administration.

Within recent years and prior to the spring of 1955 no cases or outbreaks of staphylococcal disease (except food poisoning) had been reported to the Seattle-King County Department of Public Health, and during 1953 and 1954 only one death certificate registered in King County specified staphylococcal infection as the cause of death. Consequently, staphylococcal disease was not thought to be a significant communicable disease problem and little or no energy was directed toward its prevention. The investigation reported here was initiated in an attempt to ascertain the etiologic factors responsible for the occurrence of breast abscesses among mothers and newborn infants shortly after discharge from hospital A.

Method of Investigation

Hospital A—Preliminary information concerning the onset of mastitis, number of known cases, accumulated laboratory data, and preventive measures employed was obtained. The obstetric and nursery units of the hospital were inspected and hospital records of recognized cases of breast infection were reviewed. The records were frequently incomplete and little information was available concerning illness in associated infants. To obtain more complete and comparable data the authors telephoned (if possible) each mother who had been delivered in the hospital during May and June. The following information was routinely obtained: sex of the infant, whether the infant was breast or bottle fed, and whether the mother or infant had experienced suppurative illness (breast abscesses, other abscesses, pustular skin rash, etc.). Whenever such illness had occurred an epidemiologic form was completed with the following information: name, age, sex, address, telephone number, delivery or birth date, discharge date, name of obstetrician or pediatrician, breast or bottle fed, history of illness—including nature of illness, date of onset, diagnosis, treatment, and course. After completing the survey of May and June patients, the survey was rapidly extended to include mothers and infants who were delivered in hospital A during March and April; and during September the survey was extended to include July and August patients. Whenever there was current illness in the infant or mother, the authors attempted to see the patient and obtain cultures. During July nose and throat swabs were obtained from all obstetric and nursery personnel.

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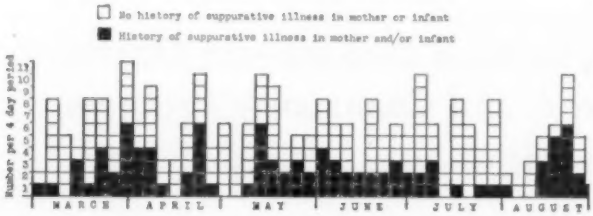


Figure 1—Suppurative Illness (by Date of Delivery) Among a Representative Sample of Mothers and Infants Delivered in Hospital A During March Through August, 1955

Private Obstetric Hospitals—During July and August a similar telephone survey was made of a representative sample of mothers and infants who had been delivered in five private obstetric hospitals * during May and June, 1955.

Community Surveys—When it became apparent that staphylococcal disease was widely distributed in the Seattle area, the authors wrote to each hospital in Seattle-King County and requested information from the administrator and pathologist concerning the number of deaths caused by staphylococci which had occurred in their hospital during 1954 and 1955 and whatever information was available concerning current or recent prevalence of staphylococcal infections in their hospitals. Private physicians and hospital laboratories were encouraged to send cultures from suppurative lesions to the Health Department laboratory for additional laboratory diagnostic procedures.

Laboratory Procedures — Specimens for diagnosis were obtained with sterile cotton swabs and were promptly plated upon blood agar plates. The plates were incubated and examined at 24- and 48-hour intervals. Colonies of staphylococci were picked from plates regardless of hemolysis or chromogenicity and coagulase tests were performed on all such subcultures. All coagulase-positive cultures were tested for antibiotic sensitivities. In addition a dozen selected cultures were sent to Dr. John Blair, bacteriologist of the Hospital for Joint Diseases, New York City, for bacteriophage typing.

Findings

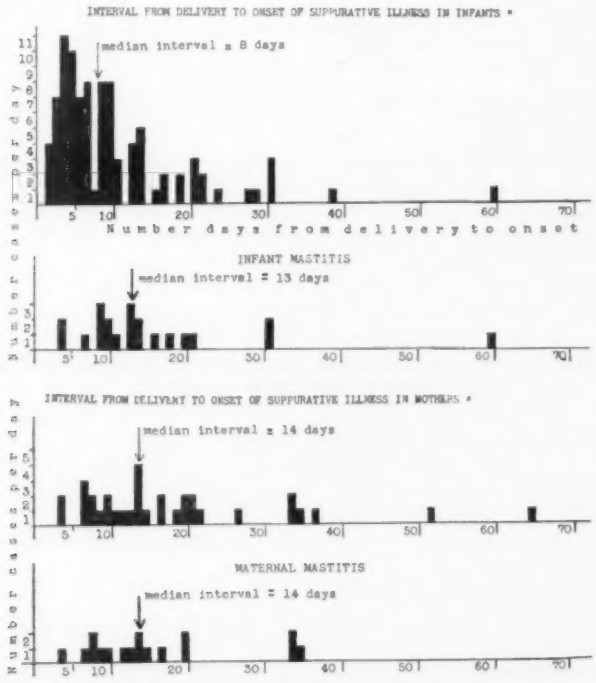
Hospital A—The discussion of the problem of breast abscesses with the obstetric staff on June 28, 1955, revealed that they became aware of such illnesses among their patients in January, 1955, and that such infections continued to occur despite intensified education of interns, nurses, and mothers concerning proper breast care. After a maternal death from septicemia secondary to breast abscess occurred during March, 1955, throat cultures had been obtained from obstetric unit personnel—with negative results except for identification of staphylococci in the culture from one physician. During May and June additional cases of maternal mastitis occurred and, for the first time, infants with breast abscesses came to the attention of the obstetric staff.

The onset of mastitis usually occurred several weeks after delivery (Figure 2); hence the staff had believed that patients became infected after leaving the hospital. Epidemiologic investigation by means of the telephone survey, supported by laboratory diagnosis whenever possible, rapidly provided compre-

* Participating hospitals identified by letters: V, F, X, Q, and M.

hensive knowledge of the extent of the outbreak, the incubation period, other manifestations of staphylococcal infection, and the major mechanism of spread (Figures 1 and 2 and Tables 1a and 1b).

A substantial and varying proportion of mothers and infants who were delivered in hospital A developed suppurative illnesses (Figure 1). Most variations in the proportion who gave histories of suppurative illness are probably due to chance distribution; an exception may be the apparent decrease in the proportion ill during most of July and early August. During this period several emergency measures were in effect: the nursery was completely cleaned, masks were worn by everyone entering the obstetric and nursery units and, perhaps most important, mothers who wished to nurse their infants were discharged 24 hours after delivery and non-nursing mothers and infants were discharged two or three days after delivery. The practice of discharging the mothers and infants early reduced the census in the nursery and obstetric ward and decreased exposure of mothers and infants to hospital environment—it also decreased contamination of the nursery by ill infants. The various corrective measures were apparently largely successful and it seemed the outbreak had ceased. Therefore, early in August the usual practice of keeping mothers and infants in the hospital for about four days after delivery was resumed, and there was some relaxation of other corrective measures such as wearing of


INTERVAL FROM DELIVERY TO ONSET OF SUPPURATIVE ILLNESS IN INFANTS *
median interval = 8 days
Number of cases per day
Number days from delivery to onset
INFANT MASTITIS
median interval = 13 days
Number of cases
INTERVAL FROM DELIVERY TO ONSET OF SUPPURATIVE ILLNESS IN MOTHERS *
median interval = 14 days
MATERNAL MASTITIS
median interval = 14 days

* Delivered in hospital A during March through August, 1955.

Figure 2—Incubation Periods

masks. However, a routine two-weeks postpartum check of most mothers and infants was instituted.

Several weeks after standard operating procedures were resumed mothers and infants reappeared in outpatient clinics of hospital A for treatment of breast abscesses and other suppurative lesions. An accurate index of the increase in suppurative illness during the latter part of August was afforded by subsequent extension of the telephone survey (findings illustrated in the July and August portion of Figure 1) and by correlation of historical data with clinical and laboratory data collected at the time of the two-weeks postpartum check. Telephone histories were obtained from a sample of 30 mothers who delivered during the last three weeks in August. Of this sample, four mothers and 17 infants had experienced suppurative illness after discharge from hospital A. Two of the four mothers and 12 of the 17 infants had returned to hospital A outpatient clinic for the two-weeks postpartum check; in each case the suppurative illness (pyoderma (10) and breast abscess (4)) had been recognized clinically and cultures had been obtained. Furthermore, all cultures were positive for staphylococci

Table 1a—Suppurative Illness Among Mothers and Infants Delivered in Hospital A During March Through August, 1955

	Number	Per cent of Sample
Total deliveries during March through August	557	
History obtained by telephone from mother	261	
History of suppurative illness in mother and/or infant	99	38.0
History of suppurative illness in mother	33	13.0
maternal mastitis	19	7.3
maternal pyoderma *	18	6.9
genital infection	4	1.5
History of suppurative illness in infant	96	37.0
infant mastitis	21	8.0
infant pyoderma *	80	31.0
other infant illnesses †	11	4.2

* Includes carbuncles.
† Conjunctivitis (8), parotitis (1), vaginitis (1), pneumonitis (1).

Table 1b—Index to Severity of Suppurative Illnesses Included in Table 1a and Figures 1 and 2

Indexes	Maternal			Infant		
	Mastitis	Pyoderma	Other	Mastitis	Pyoderma	Other
Number of illnesses	19	18	4	21	80	11
Number of illnesses treated by doctors	19	12	4	21	62	11
Per cent of illnesses treated by doctors	100	69	100	100	77	100
Number of illnesses treated with antibiotics	17	5	3	16	46	11
Number of illnesses treated with incision and drainage	15	1	1	17	3	4
Number hospitalized for treatment of illness	9	1	2	1	2	3

with cultural and antibiotic-sensitivity properties similar to the organisms recovered from lesions in June.

Table 1a indicates the incidence of various kinds of suppurative illness among mothers and infants. The finding of an 8.0 per cent breast abscess rate and 37 per cent total suppurative illness rate among infants was in excess of the authors' expectations. Table 1b provides an index to the severity of the suppurative illnesses. It is apparent that considerable serious and expensive morbidity occurred among dischargees of hospital A due to infections acquired in hospital. The reason that such a large discrepancy can exist between the actual morbidity and that which is detected by obstetric and nursery personnel is that only a small proportion of mothers and infants infected with pathogenic staphylococci while in hospital manifest such infection prior to discharge on the third or fourth day after delivery.

The median interval (Figure 2) from delivery to onset of illness was eight days in infants and 14 days in mothers. Both epidemic curves display the skewed distribution characteristic of common-source outbreaks of disease. The relationship of epidemic curves for infant and maternal illnesses suggest the precedence of the infant illnesses. This concept of primary infant infection and secondary maternal infection is fortified by additional findings: In the 34 families (hospital A sample) wherein both the mother and infant experienced suppurative illness, onset of illness in the infant preceded onset of illness in the mother in 26 (76 per cent) of cases; and 18 of 19 mothers in the sample who developed breast abscesses nursed their infants.

Early in September additional preventive measures (such as more rigid isolation technic between infants) were reinstituted which have apparently been effective in preventing suppurative illness. However, intensive and comparable surveillance has not been extended beyond the August deliveries by the authors.

Laboratory Findings — Culture of purulent drainage obtained from breast abscesses during June quickly established the cause of breast lesions to be a hemolytic coagulase-positive, Staphylococcus aureus. Furthermore, the cultures all exhibited similar antibiotic-sensitivity patterns: they were uniformly resistant to penicillin but sensitive to the tetracyclines, chloramphenicol, streptomycin, erythromycin, and bacitracin. Staphylococci with similar characteristics were isolated from all of the 18 maternal and five infant breast abscesses which were cultured, and from 22 cases of infant pyoderma, three cases of maternal pyoderma, one case of infant vaginitis, one infant groin abscess, and two cases of maternal genital infection.

Because of the retrospective nature of the study and the frequent failure of clinicians to obtain cultures, we were unable to secure laboratory diagnosis for many suppurative illnesses included in the study. Whenever such cultures were obtained, however, characteristic staphylococci were isolated. Six cultures which were obtained from hospital A patients (four from maternal breast abscesses, one from an infant breast abscess, and one from an infant groin abscess) during the period from June to September (1955) were among cultures sent to Dr. Blair for phage typing and were identified as phage Type III 42B, 42E, 44A.

Nose and throat cultures were obtained from the 26 obstetric and nursery personnel early in August; six (23 per cent) were positive for hemolytic, coagulase-positive Staphylococcus aureus.

Private Obstetric Hospital Findings— Table 2 and Figure 3 show the major findings of investigation of suppurative illness among samples of mothers and infants who had been delivered in five

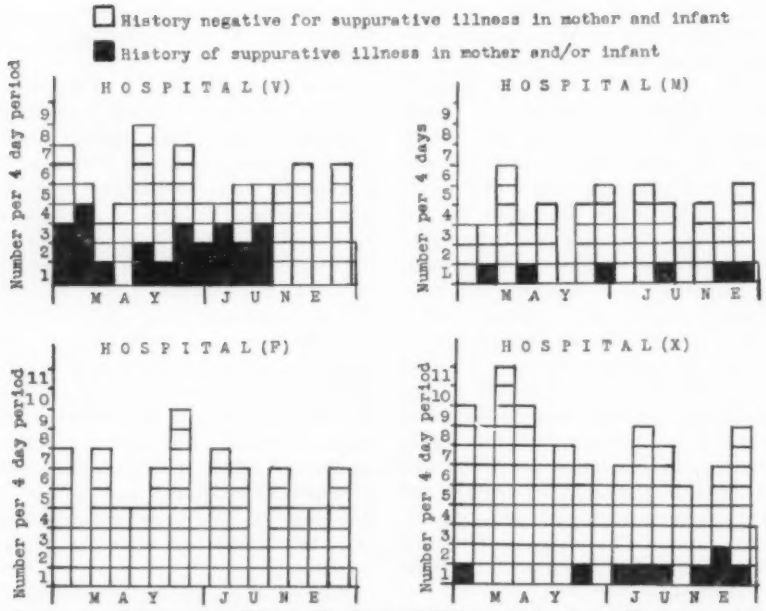


Figure 3—Suppurative Illness (by Date of Delivery) Among a Representative Sample of Mothers and Infants Delivered in Four Private Hospitals in Seattle During May and June, 1955

private obstetric hospitals during May and June, 1955. The most striking finding was the difference in suppurative illness rates among dischargees of various hospitals. The complete lack of suppurative illness among the sample of 79 mothers and 79 infants from hospital F, and the marked variation in suppurative illness rates among dischargees of hospitals V and X during the two months strengthen the evidence, provided by the epidemic curves, that

Table 2—Suppurative Illness Among Mothers and Infants Delivered in Five Private Obstetric Hospitals in Seattle During May and June, 1955 *

	Hospitals						Per cent of Sample
	V	F	X	Q	M	Total	
Deliveries per hospital during May and June	480	312	510	416	250	1,968	
History obtained from mother	78	79	109	66	56	388	100
History of suppurative illness in mother and/or infant	21	0	9	8	6	44	11.3
History of suppurative illness in mother	8	0	1	1	2	12	3.1
maternal mastitis	4	0	1	1	2	8	2.1
maternal pyoderma	5	0	0	0	0	5	1.3
History of suppurative illness in infant	20	0	9	7	5	41	10.5
infant breast abscess	4	0	0	0	0	4	1.0
infant pyoderma	17	0	9	7	5	38	9.8

* Histories obtained from mothers by telephone during August.

Table 3—Staphylococcal Deaths

Site of Infection	Number	Age Groups	Number
Pneumonitis or pneumonia, with or without empyema	16	Less than 3 months	8
Meningitis or brain abscess	4	3 months to 1 year	5
Parotitis with septicemia	1	1–5 years	3
Osteomyelitis with septicemia	1	5–25 years	3
Mastitis with septicemia	1	25–55 years	2
Peritonitis with septicemia	1	55–75 years	3
	Total 24		Total 24

the great majority of suppurative illnesses which had occurred among these mothers and infants originated in hospitals.

During August nose and throat cultures were obtained from birthroom and nursery personnel of hospital V. Twenty-two (34 per cent) of 65 nurses and aides yielded coagulase-positive, hemolytic staphylococci.

The epidemic curves for maternal and infant illnesses among dischargees of private obstetric hospitals were essentially the same as those derived from our hospital A investigation and hence are omitted.

Community Findings—In response to letters of inquiry pathologists and administrators of five hospitals in Seattle reported that outbreaks of staphylococcal disease with resultant deaths had occurred in their hospitals during 1954 and the first seven months of 1955. Altogether, responding pathologists reported 24 deaths definitely caused by staphylococci had occurred in their respective hospitals (Table 3). In addition, they reported a larger number of deaths which were possibly caused by staphylococci or to which staphylococcal infection was a contributing factor. Also, many pneumonia deaths which occurred at home and in hospitals were not subjected to post-mortem culture. The staphylococcal deaths were predominantly infant pneumonia deaths.

The information received from the 26 hospitals in Seattle-King County indicate that staphylococcal disease is a major problem in the better hospitals—the ones which have pathologists and good laboratories and a hospital-infection record keeping system. Administrators of hospitals without such resources usually stated that they had no staphylococcal disease problem.

Discussion

The telephone survey technic used permitted collection of comparable data. A number of factors contributed to the accuracy of the information: (1) The mother's attention is sharply focused upon the process of childbirth and the newborn infant. Any illness of the infant, such as skin pustules, causes concern. Furthermore, onset of illness can easily be related to specific reference dates, such as birth date, date of discharge from hospital, date of postpartum check, and other visits to doctors. (2) The mothers were subjected to detailed questioning concerning nature and severity of illnesses, date of onset, consultations with physicians, diagnosis, treatment and course. (3) Frequently a check of the accuracy of the mother's history was obtained from the doctor. Such checks revealed excellent correlation. (4) The criterion of suppuration provided a rather sharp line of demarcation between significant and nonsignificant illness; doubtful cases were excluded.

Further corroboration of specificity

of illness histories obtained by the telephone survey method is provided by the distribution of onsets and intervals from delivery to onset (Figure 2); these data were obtained about two months after delivery and one would expect that inclusion of nonspecific illnesses would have caused a more uniform distribution of illnesses during the two-month interval; however, almost all cases of suppurative illness began during the first month after delivery. Finally, the sharp contrast in findings among the dischargees of the various private hospitals (Figure 3), with use of uniform survey technic, indicates a high degree of specificity in information provided by the mothers. The comprehensive data obtained permitted a fairly accurate determination of incubation periods for suppurative illnesses (especially mastitis) in mothers and infants and calculation of attack rates.

The findings support observations of earlier investigators [1-5] concerning the epidemiology of breast abscesses, impetigo neonatorum, and other suppurative illnesses of mothers and infants during the puerperal and neonatal period. Such infections originate in nurseries and ward and delivery rooms from contaminated environment, lesions and carriers. The important role of the hands in the transfer of organisms should be emphasized.[6] In the central nursery, nurses function as "substitute mothers" for all infants under their care and, if carriers, they can readily infect the infants. Infection of one or more infants permits tremendous multiplication of staphylococci and resultant contamination of bassinets, clothing, and even nursery air [1, 7] facilitates infant-to-infant and nursery-to-infant propagation of the disease. The infected newborn infant serves as the most effective vehicle for transmission of staphylococcal disease to the mother, the family and other hospital wards. The balance of forces within hospitals is such that a large proportion of the population exposed have staphylococcal infection; whereas in homes the balance of forces is such that a lesser proportion of the population have staphylococcal infection.[8, 9]

Application of average suppurative illness rates of the current study (21 per cent of infants and 6.9 per cent of mothers) to the approximately 19,000 deliveries per year in Seattle-King County indicates that about 4,000 infants and 1,300 mothers experienced hospital-derived suppurative illness during the year. The outflow of these cases, plus an unknown number of inapparent infections was probably a major determinant of total staphylococcal disease incidence in the community. Although many infected mothers and newborns recovered without specific treatment, a fair proportion consulted doctors and a smaller proportion were hospitalized on pediatric, gynecology, and surgical wards of community hospitals (Table 1b). The existence of a plentiful and rather permanent source of infection (contaminated environment and carrier personnel) [7-10] and production and exposure of an inexhaustible supply of susceptible newborn infants permits easy propagation of the disease. The substantial intercourse of personnel and patients between hospitals dictates that effective control measures for staphylococcal disease cannot be limited to a single hospital but, rather, must encompass the community.

The finding that staphylococcal pneumonia is a major cause of death, especially of infants (Table 3), corroborates previous studies.[11-13] Staphylococcal disease, in all its various manifestations, is probably causing more deaths in Seattle-King County than any other parasitic disease; and a considerable decrease in infant mortality could probably be achieved by effective prevention of staphylococcal infection.

Reliable indexes of the importance of

staphylococcal disease in the preantibiotic era are few. However, an inspection of the literature [14] will emphasize the diversity of expression and over-all importance of staphylococcal disease during the preantibiotic era. Indeed, it appears that lack of an active attempt to prevent and control staphylococcal disease was not so much due to failure to appreciate the magnitude of the problem but, rather, to the apparent hopeless ubiquity of the infection. During the era of effective antibiotics, typing technics have been developed [15–18] which should permit rapid improvement in our knowledge of epidemiologic characteristics of each type of pathogenic staphylococci. Much of the previous lack of progress in understanding and controlling this disease was perhaps due to the fragmentary approach which was used—the concern of each specialist was largely limited to one manifestation of the disease, e.g., orthopedic surgeon (osteomyelitis), obstetrician (breast abscess), and pediatrician (impetigo). To achieve comprehensive knowledge and effective control of staphylococcal disease it appears elementary that we should consider staphylococcal disease as a single entity despite its various manifestations.

Effective preventive measures can probably be devised if community resources are integrated somewhat as follows:

Provision of adequate public health laboratory facilities, including routine determination of antibiotic sensitivities and bacteriophage type, to which clinicians and hospitals could send their cultures. With proper record keeping they would provide continuous knowledge of the distribution of various types of staphylococcal disease in the community.

Routine reporting of staphylococcal disease to local, state, and national health agencies. Such reports should indicate the site of infection, e.g., staphylococcal: mastitis, enteritis, pneumonia, meningitis, osteomyelitis, etc.

Adequate hospital epidemiology, including careful surveillance, routine identification of etiologic agent, accurate records, and thorough investigation of the source of each infection.

Routine and adequate surveillance of hospital dischargees, especially newborn infants, during the first several weeks after discharge, and thorough epidemiologic investigation whenever specific problems become apparent.

Thorough studies concerning the relative advantages and disadvantages of various systems for care of newborn infants, especially those such as rooming-in and home-delivery which preserve the integrity of the mother-infant unit and minimize their exposure to the hospital environment. Meanwhile, discharge within 48 hours of delivery will probably decrease contamination of nurseries from ill infants and thereby decrease infant-to-infant and nursery-to-infant propagation of disease.

Routine determination of the etiologic agent in all pneumonia deaths and specification of the etiologic agent upon the death certificate.

Education of hospital personnel concerning the nature of the staphylococcal disease problem and preventive measures.

Summary

An investigation of causes of breast abscesses among the dischargees of a Seattle hospital showed that the mothers acquired staphylococcal infection from their infants and the infants acquired infection in hospitals. Thirty-seven per cent of infants and 13 per cent of mothers had a suppurative illness following discharge from hospital. The median time interval from delivery to onset of suppurative illness was eight days in infants and 14 days in mothers. Eight per cent of infants and 7.3 per cent of mothers had breast abscess or severe mastitis. The median time interval from delivery to onset of mastitis was 13 days in infants and 14 days in mothers. Bacteriophage typing indicated that the hospital A outbreak was caused by Type III 42B, 42E, 44A S. aureus. An index to the severity of the suppurative illnesses is provided.

A similar survey was made of suppurative illnesses among mothers and infants delivered in five private obstetric hospitals during May and June, 1955. A striking difference in suppurative illness rates occurred among dischargees

of various hospitals. An average of 10.5 per cent of infants and 3.5 per cent of mothers had a suppurative illness.

Five hospital administrators reported major outbreaks of staphylococcal disease in their hospitals during 1954 and 1955. Pathologists reported 24 deaths definitely due to staphylococcal disease, largely infant deaths due to pneumonia, during 1954 and the first seven months of 1955. Only three of the 24 death certificates listed staphylococcal disease as the cause of death.

The discussion emphasizes the important role of hospital nurseries and infected infants in dissemination of staphylococcal disease into the community and to other hospital wards.

The findings indicate a need for improved hospital epidemiology, intensive surveillance of hospital dischargees during the first few posthospital weeks, and community control of staphylococcal disease.

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Demographic Trends in the South—Implications for Public Health Administration

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Though this discussion of the impact of population change upon public health practice is about the South and was presented before public health workers of that region, it has much of practical moment to say to the rest of us East, North, or West.

This paper is concerned with two matters: a description of the historical trend in several of the more important demographic characteristics of a vast area, including some 50,000,000 persons, which we commonly call the South, and an exposition of the meaning of the data with respect to the future of public health administration in the South. Some precedent for this type of effort may be found in the exemplary work of Lemuel Shattuck who wisely wrote "The character of man, as a social being, is modified by the circumstances of his existence. . . . An exact knowledge, too, of the living inhabitants in a given locality, is the first and an essential element for estimating their sanitary condition." [1]

The term "South" is one which is likely to engender a variety of definitions. For purposes of ready communication, therefore, and for yet a more practical reason, because a continuous series of population data are available conveniently only for regional areas as defined by the Bureau of Census, I shall herein use the term South to cover those states within the South Atlantic, East South Central, and West South Central regions.* Traditionally, this area has been one of the great agricultural centers of our country with a majority of its population occupied and resident in rural areas. It was in the coastal states of the South where, first, large numbers of the Negro race were settled and historically the South has been the cultural center for the great masses of Negroes which now are distributed nation-wide. Economically, the South has found in its agricultural base an income which failed to match the per capita revenue realized by the industrial economies of the North and Midwest. These three characteristics, a predominantly rural population, a relatively large segment of the Negro population, and a low per capita income have by and large determined the nature of the public health problems of the South and quite rightly the direction of its public health effort.

We shall, accordingly, concern ourselves primarily with a brief account of the trend in these demographic variables and with several of their more important public health correlates.

* South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; East South Central: Kentucky, Tennessee, Alabama, Mississippi; and West South Central: Arkansas, Louisiana, Oklahoma, Texas.

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Rural South

Favorable climate and a plentiful supply of labor, apparently underlie the historical fact that the South has been predominantly a region devoted to agriculture. It is in a sense odd to note that these very factors have served, in recent years, to win the South from its economic dependence upon the farm and rural life. Through the decennial censuses the Bureau of Census is able to provide an account of the trend in the relative distribution of the population, rural versus urban. In Table 1 the per cent of the total population in the South that resided in urban places is compared with that which was characteristic for the country as a whole. By 1920 the United States had as a country shifted from its early rural character so that 51.2 per cent of persons enumerated were classified as residing in urban localities. However, at that time only 28.1 per cent of the residents of the South were living in urban communities. By 1950 the striking difference between the South and the country as a whole was substantially narrowed. During the 30-year period, 1920–1950, the change of the United States toward increasing urbanization, 51.2–59.0 per cent, was accompanied by a shift from 28.1 to 44.0 per cent urban population in the

Table 1—Distribution of the Population by Area of Residence According to Broad Geographic Regions, 1920–1950

Area of Residence		Geographic Region				
		Total United States	Total South	South Atlantic	East South Central	West South Central
		Number				
Total	1920	105,710,620	33,125,803	13,990,272	8,893,307	10,242,224
	1930	122,775,046	37,857,633	15,793,589	9,887,214	12,176,830
	1940	131,669,275	41,665,901	17,823,151	10,778,225	13,064,525
	1950	150,697,361	47,197,088	21,182,335	11,477,181	14,537,572
Urban	1920	54,157,973	9,300,055	4,336,482	1,994,207	2,969,366
	1930	68,954,823	12,904,248	5,698,122	2,778,687	4,427,439
	1940	74,423,702	15,290,483	6,921,726	3,165,356	5,203,401
	1950	88,927,464	20,778,049	8,997,310	4,079,879	7,700,860
Rural	1920	51,552,647	23,825,748	9,653,790	6,899,100	7,272,858
	1930	53,820,223	24,953,385	10,095,467	7,108,527	7,749,391
	1940	57,245,573	26,375,418	10,901,425	7,612,869	7,861,124
	1950	61,769,897	26,419,039	12,185,025	7,397,302	6,836,712
		Per cent of Total in Each Area				
Urban	1920	51.2	28.1	31.0	22.4	29.0
	1930	56.2	34.1	36.1	28.1	36.3
	1940	56.5	36.7	38.8	29.4	39.8
	1950	59.0	44.0	42.5	35.5	53.0
Rural	1920	48.8	71.9	69.0	77.6	71.0
	1930	43.8	65.9	63.9	71.9	63.7
	1940	43.5	63.3	61.2	70.6	60.2
	1950	41.0	56.0	57.5	64.5	47.0

Table 2—Ratio of Population in the South to the Total United States Population by Broad Geographic Areas, 1920–1952

Areas	1920	1930	1940	1950	1952
South, All Areas	31.3	30.8	31.6	31.3	31.2
South Atlantic	13.2	12.9	13.5	14.1	14.2
East South Central	8.4	8.0	8.2	7.6	7.3
West South Central	9.7	9.9	9.9	9.6	9.7

South. The West South Central states and Florida have shown the most remarkable strides in the relative urbanization of their populations.

What then are the population forces which account for this trend? In general we may infer from available population data that a large-scale net outmigration from rural areas has taken place since 1930 and continues at present. Thus, during the 1930's it is estimated [2] that a net outmigration of three-fourths of a million persons took place from the South involving about 460,000 Negroes and 300,000 white persons. It is probable that this migrating population came from the rural areas. The phenomenon of net migration out of the South involved no less than 3,000,000 individuals during the decade 1940–1949. Yet, in spite of this net substantial loss of residents primarily from rural areas, the South has continued to produce increments to its population by natural increase so that its relative contribution in 1920 to the total United States population, 31.3 per cent, has shown little change since then (Table 2).

It is probable that the absolute increase in population in the South since 1940 has been due to the swelling of the urban fraction of the population. In accounting for this development one uncovers a substantial variation between states in their demographic growth. The extremes in this respect, based on the past five years,[3] 1950–1954, are provided by Arkansas, Oklahoma, Mississippi, and Alabama, all estimated to have lost populations and by Florida, Texas, and Maryland wherein gains exceeding 10 per cent have been shown within the five years since the last decennial census. The heterogeneity thus described suggests that the urban swing characteristic throughout the South involves in some instances a redistribution of the population with no net increase; whereas in rapidly growing states substantial numbers are being added in urban areas, with no accompanying decline in the rural areas. This account hardly constitutes an adequate description of what is without question a profound change in the way of life of the South. Perhaps, however, as we move to several other parameters of southern demography, the opportunity to fill in gaps will be present.

Negro and the South

From the public health point of view the Negro has posed perplexing and difficult problems wherever he has resided. It must be added that any group of people poorly housed and poorly educated would similarly challenge the ingenuity of a public health authority. The Negro has played a dominant role in the demographic framework of the South from the very beginning of recorded United States history. In 1790, 35 per cent of the population of the South was Negro and 91 per cent of all Negroes were resident in the South. Just prior to the War Between the States, in 1860, the Negro fraction of the South's population stood at 37 per cent. Some decline in this percentage

Table 3—Population of the South by Race According to Broad Geographic Areas, 1920–1950

	Total United States	Total South	South Atlantic	East South Central	West South Central
			All Races		
1920	105,710,620	33,125,803	13,990,272	8,893,307	10,242,224
1930	122,775,046	37,857,633	15,793,589	9,887,214	12,176,830
1940	131,669,275	41,665,901	17,823,151	10,778,225	13,064,525
1950	150,697,361	47,197,088	21,182,335	11,477,181	14,537,572
			Negroes		
1920	10,463,131	8,912,231	4,325,120	2,523,532	2,063,579
1930	11,891,143	9,361,577	4,421,388	2,658,238	2,281,951
1940	12,865,518	9,904,619	4,698,863	2,780,635	2,425,121
1950	15,042,286	10,225,407	5,094,744	2,698,635	2,432,028
			Percentage of Negroes		
1920	9.9	26.9	30.9	28.4	20.1
1930	9.7	24.7	28.0	26.9	18.7
1940	9.8	23.8	26.4	25.8	18.6
1950	10.0	21.7	24.0	23.5	16.7

was noted in 1900 when 32 per cent of the South's population was enumerated as Negro. The recent history in this trend appears in Table 3, and it is sufficient to state that as a result of substantial outmigration from the South on the part of the Negro this group in 1950 was estimated to have dropped to 22 per cent of the total population in the South. Furthermore, of the total Negro population in the United States—stated to be 15,042,286 in 1950—the proportion resident in the South had dropped from the earlier concentration of 90 per cent to about 66.7 per cent. The Negro, therefore, is declining, slowly but consistently, as a prominent segment of the South's human resources. Several other significant features of the Negro population are worthy of note. There is little question but that the educational level of this group in terms of median years of school completed rises each year. Furthermore, recent migration figures would suggest that in addition to a net migration of Negroes from the South there is an intraregion movement tending to displace the Negro toward urban places.

Income of the South

The public health analyst is uniformly impressed with the consistent relationship which may be found between the economic status of a population segment and such measurable indexes of health as the total death rate, infant mortality rate, prevalence of tuberculosis, incidence of disabling disease, etc. One may surmise that concomitantly with low income one finds poor housing, poor nutrition, inability to secure adequate medical care, and low educational attainment. Small wonder it is then that low income is a barrier to optimal health.

If one were categorically to propose the question, "What is the principal deterrent to public health administration in the South?", there is little doubt in my opinion but that the answer

Table 4—Regional Per Capita Incomes as a Per cent of the National Average 1929, 1940, and 1950

	1929	1940	1950
United States	100.0	100.0	100.0
South	58.9	65.2	74.9
South Atlantic	63.2	76.2	79.1
East South Central	47.8	48.5	60.8
West South Central	62.5	64.2	79.8

would be "low per capita income." In modern economy the income from agriculture as practiced heretofore in the South failed substantially to command for the individual the purchasing power which industry could assure to its employees. However, there are interesting developments in this area which are associated with the population movements previously described. In 1929, the earliest year for which detailed individual income data were available by state, the per capita income for the southern states as shown in Table 4 was 59 per cent of the national average. By 1950 these southern states could demonstrate a per capita income which was 75 per cent or three-fourths of the national average. This leveling process is a result of the increasing proportion of the labor force of the South which is able to derive income from manufacturing and commercial enterprise (including government). There is good reason to expect a continuation of an expanding industrial economy in the South.

In 1947 and again in 1953 the Bureau of the Census conducted a national survey of manufactures which when analyzed comparatively indicated that the South, due primarily to exceptional growth in the Southwest, was able to maintain pace with the postwar industrial spurt throughout the country. In terms of stated expenditures for development of plant and equipment in 1953, as shown in Table 5, the South with 19 per cent of the labor force in manufactures and 16 per cent of the personal income derived therefrom, was scheduled to receive 25 per cent of expenditures for expansion in this area of enterprise. There is little question but that the future would seem to hold great promise for a further narrowing of the income differential between the residents of the South and the remainder of the country.

Health of the South

The sanitary state of his water and of his food, to a large extent, deter-

Table 5—Selected Economic Data Relating to Manufacturing Activity in the South, 1953

	Persons Employed, 1953		Total Wages		Expenditures for Expansion	
	Millions of Employees	Per cent of the United States	Billions of Dollars	Per cent of the United States	Billions of Dollars	Per cent of the United States
Total United States	17.09	100.0	68.59	100.0	8.05	100.0
Total South	3.30	19.3	10.76	15.6	2.12	26.3
South Atlantic	1.82	10.6	5.67	8.3	0.84	10.4
East South Central	0.75	4.4	2.37	3.5	0.40	4.9
West South Central	0.74	4.3	2.72	4.0	0.88	10.9

Source: Annual Survey of Manufacturers: 1953. U. S. Department of Commerce, Bureau of Census.

mines an individual's capabilities of avoiding illness from typhoid fever and from the common diarrheal diseases. However modest the appropriations for public health work may be, urban places by finding common sources of water, by receiving foods through interstate traffic, and by passing if not enforcing ordinances relating to food practices have found it possible to control in good measure disease due to the above conditions. The same statement cannot be equally applied to rural areas. Common water supplies are not easily established. Food practices, either commercially or on a personal basis, are difficult to control. As a result, careful study of our vital statistics will reveal a rural area excess in mortality due to typhoid fever and associated diseases when compared with urban areas. The differential is not startling—the problem could be controlled, but it requires an expenditure of funds in areas where the per capita income is at a minimum.

The ability to deliver a child in safety and in the absence of the risk of maternal death depends upon seeking medical advice early in pregnancy, delivering under circumstances which minimize shock due to postpartum hemorrhage, and where infection can be either prevented or quickly controlled by employment of antibiotics. The element of good medical care, prenatally, at labor, and during the early postpartal period is thus of critical importance. In spite of proved assertions that the South has a disturbingly low ratio of doctors to population—70 physicians in private practice per 100,000 population in the Southeast and 85 per 100,000 in the Southwest, as contrasted with 102 for the United States [4]—it is extremely difficult to note wide absolute departures in the South from the United States infant mortality and maternal mortality rates, when these are considered on a race-specific basis (Table 6).

Health during early, middle, and late adult life is no doubt dependent upon a multiplicity of factors, among which nutrition and an adequate level of medical care are not to be discounted. In spite of the fact that the South lags in per capita income and has serious comparative deficits in available medical manpower, the death rates when considered on an age-adjusted basis and by race reveal that once again no striking excess of mortality is found in the South. These findings, no doubt, may cause some consternation to logical analysts who, given the social and economic picture earlier described might have expected a state of sanitary collapse in the South. Somehow in the face of serious odds the South is proving capable of assuring its residents an acceptable standard of health, that is, one which approximates closely the national average. Is it possible that the public health program is achieving this leavening influence?

Notwithstanding this seemingly bright picture, there are serious problems which the South faces, in company with the rest of the country. These result from the trends heretofore described which suggest that demographically the South is moving in the direction of the national pattern. It is in connection with these problems that public health authorities in the South will want to consider carefully their particular responsibilities.

Public Health in the South Reconsidered

The growing populations in the urban areas of the South and their relatively adequate incomes earned in industry and in commerce should provide new opportunities for public health personnel with medical, nursing, engineering, and other technical skills. However, this will not come to pass if public health as a discipline fails to find for itself areas of responsibility as critical

Table 6—Selective Health Indexes by Broad Geographic Areas, 1953

Geographic Area	Infant Mortality (Per 1,000 Livebirths)	Maternal Mortality (Per 10,000 Livebirths)	Total * Mortality (Per 1,000 Population) 1950	Per cent of Livebirths Delivered in Hospital
		All Races		
United States	27.8	6.1	8.4	92.8
Total South	32.4	9.3	8.7	82.5
South Atlantic	31.4	8.5	9.1	83.2
East South Central	34.0	12.1	8.9	76.1
West South Central	32.7	8.4	8.1	86.2
		White		
United States	25.0	4.4	8.0	96.5
Total South	27.4	5.6	7.8	92.0
South Atlantic	25.3	4.8	8.0	94.8
East South Central	28.9	6.8	7.9	89.3
West South Central	29.2	5.9	7.5	90.3
		Nonwhite		
United States	44.7	16.6	12.2	70.3
Total South	46.0	19.3	12.3	56.7
South Atlantic	45.7	17.3	13.0	55.9
East South Central	46.0	24.6	12.4	45.4
West South Central	46.7	18.1	11.0	70.1

* Age-adjusted rates. See reference No. 4.

and unique as the control of communicable diseases and the sanitary control of food and water supplies were in 1920. Blue Cross, Blue Shield, workers' compensation, disability insurance, comprehensive medical care plans, labor health centers—these constitute a new background for the stage upon which we are called to play. Public expenditures for medical care to the indigent are reaching substantial proportions and seemingly cut across the maternal and child health work as it was conceived in the 1930–1950 period.

Faced by a rapidly changing social and economic order, the public seeks leadership, sanguine in perspective, politic in direction, assured in its grasp of the technics to advance public health. It is a logical and a necessary step for the public health profession to play a mature role in maintaining a continuous survey of the manpower available, the moneys invested, and the specific problems worth attacking in any jurisdiction where a public health organization exists.

Perhaps, there may be misgivings from some medical circles as to the propriety of this activity. But unless it is fully recognized that preventive medicine as a specialty is intimately concerned with the problems of covering the population with medical care, we do in effect deny to this medical area one of its most logical functions. Admittedly, the private practitioner, the surgeon, and the hospital director are equally concerned and no planning is sound which fails to recognize the pivotal role these groups play in the implementation of any study, recommendation, or pro-

gram for medical care. It will, therefore, stand as an axiom that the closest professional relationship will be sought with the established medical societies as the public health agency assumes a role of leadership in surveying the community status in respect to medical care coverage. Lest I be mistaken, such leadership implies no responsibility for administration other than for selected aspects of the tax-supported medical care program when it appears that the health agency is the logical unit for such work.

There are certain characteristics common to urban culture, wherever it may be geographically found in this country. The more important of these from the public health point of view are: (1) isolation of the family unit, (2) concentration of the population, densitywise, and (3) rigidity of the work situation for the laboring force.

A family unit consisting of the household head, his wife, and children is comparatively isolated when personal contact with immediate relatives is, at best, only periodic in frequency and more commonly is of a semiannual or annual nature. Under these circumstances the family unit is under immense stress whenever illness, say exceeding 30 days in duration and requiring skilled personal care, strikes one of its members and in particular an adult member. In an urban culture we have sought more and more to institutionalize such persons because of the inability of the family to cope with this problem. However, for many reasons, economic, humane, and medical, it is desirable to allow the individual faced with long-term illness to remain in the home if possible and if sufficient support can be given to the family.

Now here is a problem of no small dimension in urban communities. The public health department could beg off by claiming that this is a problem of medical care, pure and simple. But this attitude will hardly gain for the health department the respect and admiration of the community which rightfully is reserved for the agency, public or otherwise, which shows determination to address itself toward current, real, and pressing community health problems. The concept that defines public health work according to the hard and narrow dichotomy of preventive versus curative medicine cannot be defended against the thesis that the integrity of the family unit is our best assurance to minimize direct public responsibility for illness and maximize personal efforts to restore and maintain a state of health. Actually the problem is not primarily one of medical care. There may be adequate provision for personal physician's services, but what is needed is the support which a visiting nurse can offer either by instruction, by demonstration, by provision of specific nursing skills, or by assisting the family to obtain such help as may be available in the community and known to the nurse. This, then, is an instance of the manner in which home nursing, an established activity of the public health effort, can be adapted to meet the inevitable need of the expanding urban culture in the South.

Urban populations develop density patterns, which when not early controlled, may result in undesirable and potentially harmful concentration of industrial wastes in the atmosphere. In addition, the nature of construction permitted for residential use, if not well controlled, invites the early development of substandard housing conditions and urban blight, the environmental disease of older urban communities. The health department whose jurisdiction includes growing urban areas should seek to obtain recognition of these problems in local ordinances specifying hygienic standards for residential construction and for industrial operations.

The work situation of the urban com-

munity is such that increasing numbers of the population are engaged in industrial and commercial enterprises wherein the number of work hours, 35–40 hours per person per week, is but a fraction of the total time an individual is awake. Nevertheless, a high concentration of effort is generally required and great emphasis is placed upon conformity to work standards, including promptness in reporting to work, well defined periods to eat, etc. There is little question but that this type of discipline is necessary in order to crowd within a short work week sufficient production to assure currently desired standards of living. But we have increasing evidence that emotional disorders in early adulthood and in the labor force constitute one of the principal causes of disability, and there is suggestive information that in some urban school situations, 60–70 per cent of children referred to school physicians appear to have an emotional basis for their difficulties in adjusting to the school environment. The nature of the environment of an urban area, the evidence on causes of disability, and increasing demands from parents and school authorities for assistance in solving child behavioral problems insistently point to the need for the public health department to blueprint its role and take action accordingly in the prevention of serious mental disease.

Conclusion

Demographically, it is clear, that the future population growth of the South will take place in urban areas. Because of the manner in which such communities live and work, they tend to provide satisfactory economic standards. Such standards generally include provision for expenditures for medical care based on prepayment schema and which in many cases are quite generous. Basic provisions for safe water supply and adequate food control practices are well within the capabilities of such places.

The health problems of today's urban community are vastly different than those of several decades ago, and a public health department operating in such an area has an exciting and professionally stimulating role to play if it will but respond to the needs of today and those of tomorrow of its urban residents. These needs cannot be adequately met if the public health agency fails to comprehend that the first essential for a sound preventive medical program is adequate coverage of the population with medical and nursing skills.

To a large extent this coverage can be provided through the existing services of personal physicians and hospital centers. Facilities for diagnosis of cancer, for detection of early emotional disorders in children, for the nursing care of homebound, long-term illness cases, etc., in many instances are lacking or deficient.

The public health department will demonstrate its maturity and usefulness to the modern urban community by the statesmanship it exhibits in the solution of such unmet needs.

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Antibiotics in Food Preservation

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This note of caution in regard to the use of antibiotics as a preservative is published simultaneously with a Spanish translation in the Boletín de la Oficina Sanataria Panamerica.

The possible exposure of large segments of the world's population to a multiplicity of antibiotics is a matter of some concern. The problem that confronts us today is no different in principle from that facing the United States in the days of the first Food and Drug Act, June 30, 1906. The main difference is the vast number of new chemicals now used or proposed for use in food for man and other animals.

Under the present Food, Drug, and Cosmetic Act, antibiotics are pesticide chemicals when used as preservatives on or in raw agricultural commodities. The first commercial use of an antibiotic in the processing of a perishable food became possible on an interstate basis on November 30, 1955. On that date the Food and Drug Administration cleared chlortetracycline for use "in and on uncooked poultry." The Food and Drug Administration's action represented the final stage of clearance for this substance under section 408 of the federal Food, Drug, and Cosmetic Act which provides for the establishment of safe tolerances for residues of pesticides in or on raw agricultural commodities. This section, the so-called Miller Bill, was added to the act in 1954. Under it the secretary of agriculture must first issue a certificate of usefulness (a judgement of utility) before the secretary of health, education, and welfare acts on tolerance or judges the safety of the application that is proposed. Chlortetracycline met these criteria in regard to poultry, and the FDA statement said, "The tolerance of 7 parts per million is established for residues of chlortetracycline in or on uncooked poultry." FDA's decision was based on scientific evidence that cooking helped to destroy this amount of chlortetracycline so that none is left when the meat is served.

Regulatory agencies are extremely important to insure the fulfillment of individual corporate responsibilities. New developments can add to public health, nutrition, and safety, or they may be potentially injurious. To prevent the latter is in reality the responsibility of regulatory officials.

The FDA's views about the use of antibiotics in food have been set forth in the following Statement of Policy (§ 3.29) of November 30, 1955: "Direct or indirect addition of antibiotic drugs to foods for human consumption. (a) The Food and Drug Administration has received inquiries concerning the use of antibiotic drugs as food preservatives. Careful consideration has been given to this question and the conclusion has been reached that such use constitutes a public health hazard. Consumption of food so treated may cause sensitization of the consumer to such antibiotics and may result in the emergence of strains of pathogenic micro-organisms resistant to these drugs.

"(b) The presence of antibiotic drugs in foods intended for human consumption, or the direct or indirect addition of such drugs to such foods, may be deemed an adulteration within the

meaning of section 402 [1] of the Federal Food, Drug, and Cosmetic Act (Sec. 402, 52 Stat. 1046; 21 U. S. C. 342).

"(c) This statement of policy will not bar the establishment of safe tolerances for antibiotic drugs in or on raw agricultural commodities under the provisions of section 408 of the Act, where suitable evidence of usefulness of the antibiotic drugs and of safety of the residues is available."

Before any country permits the addition of antibiotics to its food supply it should satisfy itself that this addition does not endanger the health of the consuming public. It should be the responsibility of the manufacturer or individuals wishing to market or use such a product in a country to establish or demonstrate beyond any reasonable doubt that the use of their product will not endanger the food supply or the public health of the people consuming the product so treated. If regulations do not already exist to protect against such eventualities, they should be considered at the earliest time because there is no doubt that these products will have widespread promotion throughout tropical areas where lack of refrigeration now keeps meat scarce and expensive.

Where sanitation and refrigeration facilities are inadequate, preparation and storage of food, especially meat and meat products, is a constant concern to health officials. Various types of chemical preservatives have been used since very early times, such as salt for dehydration and vinegar for pickling.

Recently, much has been written about the use of antibiotics for preservation of food products. They will inhibit or destroy the growth of many food spoilage organisms. Neither refrigeration nor antibiotics will sterilize food. Antibiotics alone may add sufficient time to the keeping quality of some foods to permit more efficient and less wasteful distribution of the food. The benefits resulting from the use of antibiotics in food processing may be less in the United States than in some other parts of the world which may enjoy only limited or no refrigeration facilities. Since antibiotics may only inhibit bacterial growth and not destroy it directly, they are useful where the total number of potential spoilage organisms is low. Therefore, it is important that the producer of a product on which antibiotics are to be used be doubly careful in preventing contamination of the food products during processing.

Processing of fresh dressed poultry has always presented serious spoilage problems. Much has been done in recent years to improve poultry processing operations and although improved sanitation has done much to better protect the consumer, dressed and cut-up poultry still deteriorates rapidly. Recently research workers have found that the tetracycline group of antibiotics

1. Sec. 402. A food shall be deemed to be adulterated—
(a) (1) If it bears or contains any poisonous or deleterious substance which may render it injurious to health; but in case the substance is not an added substance such food shall not be considered adulterated under this clause if the quantity of such substance in such food does not ordinarily render it injurious to health; or (2) if it bears or contains any added poisonous or added deleterious substance which is unsafe within the meaning of section 406; or (3) if it consists in whole or in part of any filthy, putrid, or decomposed substance, or if it is otherwise unfit for food; or (4) if it has been prepared, packed, or held under insanitary conditions whereby it may have become contaminated with filth, or whereby it may have been rendered injurious to health; or (5) if it is, in whole or in part, the product of a diseased animal or of an animal which has died otherwise than by slaughter; or (6) if its container is composed, in whole or in part, of any poisonous or deleterious substance which may render the contents injurious to health.

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(chlortetracycline, oxytetracycline, and tetracycline) were the most effective of 10 antibiotics tested in controlling the growth of organisms isolated in spoiled poultry. These workers have shown that double the shelf time of dressed poultry can be obtained by proper use of antibiotics. There is no doubt that there will be an increased interest in this use of antibiotics by poultry industries the world over.

Antibiotics of the tetracycline group have been used experimentally in the preservation of fish and red meats. Ice containing about 5 ppm chlortetracycline has been used to pack fish. Others have used experimental dips and sprays of antibiotics for fish and each method has shown promise as a means of extending the keeping quality of this highly perishable food.

There are several ways of using antibiotics in the preservation of red meat. For beef a technic for infusion of the entire carcass after slaughter has been published by Deatherage and his collaborators at Ohio State University.

They have also investigated infusion of the live animal prior to killing. The infusion technic works quite well for cattle and sheep, but is more difficult to apply to swine. Intraperitoneal injections of antibiotics a short time before slaughter offer some possibilities. This must be done about one to two hours before slaughter to allow for the circulation of the antibiotic. It should be noted at this point that the keeping quality due to the use of antibiotics has only been extended a matter of days. The ultimate goal of actual permanent preservation is not in sight.

Antibiotics have been suggested for use in other foods, such as milk, eggs, and fresh vegetables. Because antibiotics may inhibit starter cultures used in cheese manufacture, dairy products that are going to be used for the production of cheese should under no circumstances contain antibiotics.

Although there are glowing reports of the advantages to be realized from use of antibiotics, it is well to sound again a note of caution. Regulatory officials in the United States believe their safety has not been established for most of the proposed uses. The status of antibiotics in food in the United States is:

They may be used so that no residues remain in the food. This is acceptable.

They may be used so that residues remain in the uncooked food. This is acceptable provided the food is always cooked and the cooking always destroys all of the antibiotic (and in the United States provided the residues in the uncooked product are within an official tolerance).

They are being considered for uses which will leave some of the antibiotic in the food as it is eaten. Their safety under these conditions has not been established.

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Correcting the Reported Incidence of Congenital Syphilis in Philadelphia

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Referring reported cases of congenital syphilis to the year of their occurrence (the year of birth) provides a more accurate perspective of past performances and their relation to current conditions and may suggest ways to improve future programs.

The purpose of this presentation is to discuss methods for correcting reports of the incidence of congenital syphilis, in an effort to arrive at a more accurate measurement of accomplishment in the control of syphilis in a large urban population. As material it uses 2,916 cases of congenital syphilis, reported as occurring in Philadelphia, with a population of about two million, over a 26-year period from 1930 to 1955.

Determination of the incidence of syphilis is always difficult because few patients come under observation when they first acquire the disease and accurately dating the duration of the infection after the initial symptoms have disappeared is next to impossible. There is usually no attempt to relate the various stages of syphilis, when reported, to the year in which the disease was acquired since it is impractical in most cases to tell when the infection was transmitted. In gauging the effectiveness of a program to control syphilis, health officers are usually required to base their determinations on the morbidity reporting of primary and secondary syphilis, however incomplete, or on analyses of the prevalence of the disease in young persons as compared to older age groups through a variety of survey methods. These approaches, though useful, are very inaccurate at best, and often reflect the intensity or effectiveness of case-finding activity rather than the true incidence of the disease.

Congenital syphilis, properly diagnosed, is the one stage of the disease for which the time of acquiring the infection can be accurately dated. Even though congenital syphilis may not be detected for many months or years, it can routinely be presumed that the disease was derived from the mother during the last few weeks or months of intrauterine life. Intensive study of selected groups of mothers with syphilis, moreover, indicates that women with recently acquired active infections pass the disease on to their unborn child with considerable uniformity. The occurrence of congenital syphilis, if properly related to the year of birth, accordingly, can give a good index of the occurrence of active syphilis in women of the child-bearing-age groups and, in addition, can test the effectiveness of the application of the known control measures. In localities where active case finding is being conducted, most of the cases of congenital syphilis will be detected in the course of time even if missed at birth or during the first year of life. Our own detailed studies of the inci-

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dence of syphilis in school-age children in Philadelphia have indicated that more than four-fifths of this disease, detected up to the age of 12 years, is congenital.[1]

Significance of Crude Congenital Syphilis Morbidity

Crude congenital syphilis morbidity is regularly tabulated as the number of reported cases per 100,000 population for the year in which the notice is received. The disease, however, may have occurred many years before reported. These rates for Philadelphia compared to continental United States are shown in Figure 1.

During the years 1930–1935, in Philadelphia, syphilis reporting was at a low ebb and the congenital syphilis morbidity rates reflect this. Several events followed in rapid succession to stimulate interest in the control of congenital syphilis during the next five years. There was, first, the publication of the Syphilis in Pregnancy Studies of the Cooperative Clinical Group starting in 1934.[2] Then, there was the Washington venereal disease control conference in December 1936,[3] inaugurating the national venereal disease control program in 1937, which began to have its impact on Philadelphia the following year, with the start of a state-sponsored, federally-supported local program. Next, the Pennsylvania premarital and prenatal examination law was passed in 1939. All of these program developments resulted in a sixfold increase in the detection of congenital syphilis in Philadelphia between 1935 and 1940. The detection remained high during the active development of the Philadelphia, along with the national, venereal disease control program during the next five years. The peak in the detection of congenital syphilis, reached in Philadelphia in 1947, was immediately after the introduction of penicillin for general use by the medical profession, and corresponded locally to the period when case finding for all stages of syphilis was at its height. The rise in crude congenital syphilis morbidity in the time periods just referred to, represented the results of active case-finding effort in a high prevalence area and did not necessarily reflect an increase in the incidence of syphilis in the community. From 1947 on, the decline in crude congenital syphilis morbidity has been marked but it still represents an admixture of all age groups with only a small fraction attributable to the year in which the report is made.

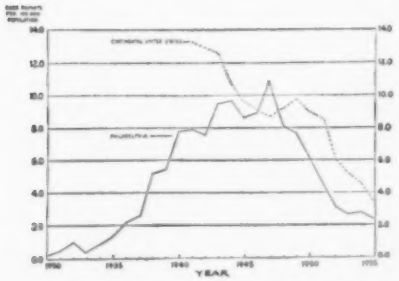

Figure 1—Crude Congenital Syphilis Morbidity by Years. Philadelphia Compared to Continental United States 1930–1955

Some health workers have suggested tabulation of the reported cases of congenital syphilis under one year of age, as an index to the incidence of congenital syphilis. While such a compilation does away with the problem of inclusion in the year of discovery older persons whose disease was acquired in previous years, it is still subject to the vicissitudes of the intensity of the case-finding program.

Correcting the Reported Incidence of Congenital Syphilis

Two principal types of correction were made in obtaining the incidence of congenital syphilis for Philadelphia as

Table 1—Corrected Incidence of Congenital Syphilis in Philadelphia for the Years 1930–1955, with Number of Cases Reported Each Year (Crude Morbidity) Included for Comparison

Year	No. of Cases of Congenital Syphilis Reported (All Ages)	Corrected No. of Cases Reported During First Year	Corrected No. of Cases Referred Back to Year of Birth from Later Years	No. of Infant Deaths from Congenital Syphilis	Corrected No. of Cases of Congenital Syphilis Attributable to Year of Birth	Corrected Congenital Syphilis Rate per 1,000 Live Births
1955	50	2	–	1	3	0.06
1954	63	4	4	2	10	0.19
1953	58	1	1	None	2	0.04
1952	65	3	1	None	4	0.08
1951	97	9	2	2	13	0.26
1950	128	12	None	3	15	0.31
1949	161	24	7	8	39	0.83
1948	165	23	4	7	34	0.71
1947	217	36	11	10	57	1.07
1946	177	18	25	14	57	1.21
1945	169	29	18	6	53	1.36
1944	191	22	30	12	64	1.64
1943	187	15	40	13	68	1.55
1942	148	9	33	8	50	1.19
1941	154	4	52	17	73	2.15
1940	152	13	43	14	70	2.26
1939	107	12	58	22	92	3.06
1938	97	4	74	16	94	3.03
1937	50	5	88	24	117	3.89
1936	42	7	145	22	174	5.86
1935	27	3	154	17	174	5.80
1934	17	2	157	21	180	6.04
1933	7	1	120	20	141	4.78
1932	19	5	145	33	183	5.70
1931	9	3	141	30	174	5.15
1930	3	1	133	34	168	4.73

shown in Table 1. First, the disease reported each year was referred back to the year of birth. Second, all diagnoses were reviewed for the years 1945–1955 of reported cases of congenital syphilis under one year * and for the years 1944–1947 for all the school-age children 6–18 years.

The diagnoses of infants less than one year of age reported to have congenital syphilis reviewed prior to 1950, have indicated very few probable errors. Considerable correction is required, however, as a result of the Philadelphia experience, in cases reported during the last five years. Prior to the advent of penicillin, treatment for syphilis was long drawn out and fraught with dangers from bismuth or arsenical intoxication, serious to the small and debilitated infant. It was customary, in this period, to establish clearly the existence of syphilis before antisyphilitic therapy was given, and the principal medical and health problem to be combated was long delay in diagnosing and treating the syphilitic infant. With

* Since 1952, investigations to correct morbidity reports of congenital syphilis have been conducted by Ira L. Shamberg, M.D.; Marvin S. Greenberg, M.D.; and Eugene J. Jones, senior venereal disease investigator, under the general supervision of John W. Lentz, M.D., chief, Section on Venereal Disease Control.

the use of penicillin, many of the dangers of treatment have been removed and the tendency is to treat on suspicion alone. It seems to be customary to report the case as congenital syphilis, if treated for syphilis, even though there was no great likelihood of active infection.

Information is now available to establish the probability of congenital syphilis in such cases, based upon expert reappraisal of the facts surrounding the medical management. Of seven cases reported as infantile congenital syphilis in Philadelphia in 1955, the diagnosis was not confirmed in five; of nine cases in 1954, it was not confirmed in five; in 1953, of five cases reported, it was not confirmed in four. All told, between 1945 and 1955, a review of the diagnoses of infants reported to have congenital syphilis removed 21 cases from a total of 182 and resulted in a correction of 13.4 per cent. Currently, with more than half the reported cases of infantile congenital syphilis, there is little likelihood, apparently, on the basis of detailed medical appraisal of the mother and child, that the infant actually has the disease.

The corrected incidence of congenital syphilis in Philadelphia (Figure 2) should be compared to the crude syphilis morbidity already shown (Figure 1). All during the period of maximum case-finding activity for congenital syphilis in Philadelphia (1937–1947), as indicated by increasing syphilis morbidity in the previous chart, there was a steady and almost precipitous decline in the true incidence of congenital syphilis. For the period 1930–1937, when the amount of congenital syphilis being discovered in Philadelphia was small, the actual incidence of the disease was at its peak varying between 4.73 and 6.04 cases per 1,000 live births. The true decline in incidence of congenital syphilis antedated the decrease in morbidity reports by more than ten years and corresponded to the start of the national and the Philadelphia venereal disease control program in 1937. The decline was further speeded by the application of the Pennsylvania premarital and prenatal examination laws which had their effect starting in 1940. There was a slight upsurge in congenital syphilis in Philadelphia during World War II, but the incidence of congenital syphilis in 1945, even following this increase, was less than one-fourth the incidence in 1936. This is at complete variance with the crude morbidity statistics. With the use of penicillin the apparent incidence of congenital syphilis has continued to decline and, in Philadelphia, is now in the magnitude of one case per 10,000 live births and approaching zero.

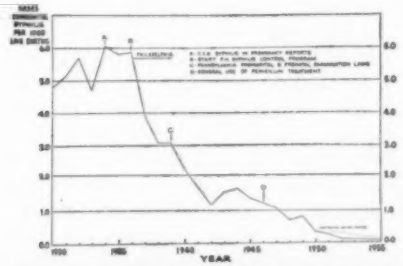

Figure 2—Corrected Incidence of Congenital Syphilis—Philadelphia 1930–1955

Congenital Syphilis Mortality

Despite the fact that infant mortality rates from syphilis represent only a portion, though undoubtedly the most serious part, of the congenital syphilis problem, they seem to correlate much more accurately with the trend of incidence of syphilis in the community than do the crude morbidity reports. The Philadelphia death rates of congenital syphilis under one year per 1,000 live births have been tabulated from 1918 to 1955 and are compared with the rates for continental United States from 1933

to 1954 (Figure 3). The general trend is steadily downward from the first World War to the present. The decrease is sharpest from 1939 to 1945 with the addition of the premarital and prenatal examination law to the other control efforts. The 1945 rate was about one-fifth the 1939 rate. Since 1946, with the general use of penicillin in the treatment of syphilis, the infant mortality rate has further sharply dropped and now approaches zero. There were no known infant deaths from syphilis in Philadelphia in 1952 or 1953; only one death was reported in 1955, and two deaths each were reported in 1951 and 1954.

Diagnosis of Infantile Congenital Syphilis During the First Year of Life

Another gauge of the effectiveness of a syphilis control program is the determination of the percentage of congenital syphilis cases diagnosed during the first year of life. The corrected incidence of congenital syphilis, when compared to the crude morbidity reports by years, makes it possible to calculate this percentage from the Philadelphia records for the years 1930 to 1949. During the period 1930 to 1935, between one-tenth and one-fifth, only, of cases of congenital syphilis were diagnosed during the first year of life. With the development of the syphilis control program, this percentage increased to reach a level of between 80 and 90 per cent of cases diagnosed within the first year, in the period 1947 to 1949.

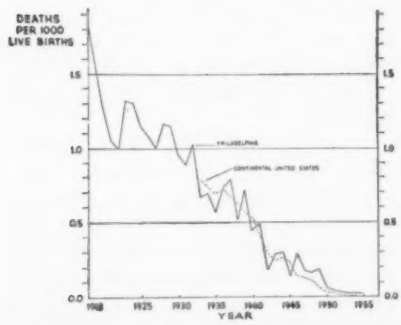

Figure 3—Infant Mortality from Congenital Syphilis. Philadelphia Compared to Continental United States 1918–1955

Discussion

Earlier reports from the Scandinavian countries and Great Britain, as referred to by Clark [4] and Moore,[5] apparently did not endeavor to correct crude congenital syphilis morbidity data. The decline in congenital syphilis, shown in Copenhagen 25 and 30 years ago, for example, apparently represents the same type of trailing off at the end of a sustained antisyphilis campaign of many years duration that is currently being shown in the crude congenital syphilis reports of various health jurisdictions in the United States.

Until relatively recent years analysis of congenital syphilis reports by age groups is uncommon but some such reported studies in England go back more than 25 years. As early as 1930–1934, analyses of the reports of congenital syphilis from England and Wales showed only 14 per cent of the cases were being detected during the first year of life and demonstrated that, in any one year, about 40 per cent were attributable to intervals more than 15 years previously (i.e. to the time of World War I or before). Of 2,008 cases of congenital syphilis reported in England and Wales during 1934, only 286 cases were less than one year of age and 839 were over 15 years of age.[6]

Bauer,[7] in 1949, pointed out the fallacies of the use of crude congenital syphilis morbidity statistics to demonstrate effectiveness of newer control methods in combating this disease, and others were quick to elaborate on this

problem using information available in their own health jurisdictions. Fiumara [8] showed that in Massachusetts 95.1 per cent of cases of congenital syphilis reported in 1949 were over one year of age, and in the 1950 material, 97.3 per cent were more than one year old. Of 187 cases of congenital syphilis discovered through a special project in the state of Delaware, in 1949 and 1950, only seven cases (2.7 per cent) were less than one year old.[9] Between 1941 and 1950, in New York City, only about 20 per cent of reported patients with congenital syphilis were less than one year old when the report was made.[10] In the same health jurisdiction, from 1946 to 1950, the decline in all reported syphilis was 59.8 per cent, but of congenital syphilis only 13.3 per cent. The figures from the syphilis clinics in Bologna, Italy, for the period 1930–1949 are similar.[11] In this last mentioned community the decline in early acquired syphilis cases seeking treatment was 86 per cent from the peak year (1938), but the decline in congenital syphilis of all age groups was only 50 per cent from the peak year (1941).

Vought and his coworkers [12, 13] in commenting on the congenital syphilis statistics from New York State, for the years 1936 to 1953, have "the impression that early congenital syphilis is disappearing much more rapidly than other forms of syphilis," but remark "it is difficult to adduce direct evidence from routine morbidity reports." Brewer and Condit [14] have analyzed the state of California reports for the years 1938 to 1950 and have pointed out that "the cases of congenital syphilis that are diagnosed before the patient reaches the age of one year do not, unfortunately, represent the total problem. In 1940 for each case reported in an infant under one year of age, there were 5.7 cases reported in infants over that age. In 1950 there were eleven times as many persons over one year of age as there were infants under that age."

Wright, Sheps, and Glifford [15] seem to have given the most careful analysis, thus far, of the statistical approaches to the measurement of the incidence of congenital syphilis. They have also presented a limited application on the method of referring reported cases of congenital syphilis back to the year of birth with the records from Durham, North Carolina, and from the state of Kentucky. Unfortunately, as Nelson and Struve [16] have pointed out in reviewing the problem for the city of Baltimore, this method is not completely practical to determine current status of congenital syphilis because the procedures required "constant revision of each annual infant morbidity rate for fifteen to twenty years or more, as congenital syphilis infections in older children" are being discovered. None the less, where the records lend themselves to this type of analysis, it seems worth while to make these corrections at least once, if not on a current basis, in order to obtain, as accurately as possible, a perspective of past performance in relation to current status and future program planning. The less perfect methods for currently analyzing syphilis morbidity become much more meaningful, after they have been compared to the more exact figures obtained from correcting the incidence of congenital syphilis.

Syphilis was made a reportable disease in Philadelphia effective January 1, 1918, by action of the Board of Health November 16, 1917, and 1,033 cases were reported the first year. Information on infant deaths from syphilis in Philadelphia is available at least as far back as 1913. Interest in the analysis of congenital syphilis reports by age when discovered, started in 1944 and has continued since that date.

For purposes of the present study, corrections of the crude morbidity data for congenital syphilis were carried back to 1930. These records have been kept and analyzed by each year of life, rather than by age groups, such as is commonly used with morbidity reports. It has been possible, therefore, to refer each case back to the exact year of birth.

Some cases of congenital syphilis may, of course, escape detection completely, and if discovered eventually in older persons may be attributed to acquired disease. None the less, this is the only stage of syphilis in which the disease, detected many years later, may be referred back accurately to the year in which it is transmitted. The date of onset of acquired syphilis in the adult can be accurately determined in only a small percentage of cases at the time they come under observation. In a community with an effective case-finding program most patients with congenital syphilis will be detected in time.

At least two of the recent reports [13, 16] have presented arguments to suggest that diminution of infantile congenital syphilis below the present level of about one case per 10,000 live births can hardly be expected with present control methods. As the fixed level of endemicity is approached the true incidence of congenital syphilis may well remain one of the most sensitive available indexes of any major break of the essential elements of a total community syphilis control program.

Summary

Crude morbidity reports of congenital syphilis tend to reflect the extent of case-finding activity and are grossly misleading if used to evaluate effectiveness of treatment to reduce the occurrence of new cases.

Of the indexes of syphilis control which may be applied on a current basis to test total program effectiveness, mortality from infantile congenital syphilis seems to align itself closest with the program changes.

The corrected incidence of congenital syphilis seems to be one of the most sensitive indexes available to assess the long-range effectiveness of the over-all syphilis control program. It is of less value for current evaluation but is an important device to gain perspective over an extended period.

The universal use of penicillin to treat the syphilitic pregnant woman has created additional problems in correcting infant morbidity statistics for congenital syphilis because of the growing tendency to treat all seropositive infants and the feeling that infants, if treated, must be considered syphilitic for purposes of record keeping and subsequent attendance follow-up.

The fact that ever greater percentages of syphilitic infants are being diagnosed during the first year of life is a further indication of the effectiveness of the coordination of the educational, social, public health, epidemiologic and medical components of a syphilis case-finding and treatment control program.

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Commissioned Officer Examinations

A competitive examination for appointment of Medical Officers to the Regular Corps of the U. S. Public Health Service will be held in various places throughout the country on November 27–30, 1956. Entrance examinations include an interview, physical examination, and comprehensive objective examinations in the professional field. Appointments providing opportunities in public health, clinical medicine, and research will be made in the ranks of Assistant and Senior Assistant, equivalent to Navy ranks of Lieutenant (j.g.) and Lieutenant.

United States citizenship and graduation from a recognized school of medicine are requirements for both ranks. For the rank of Assistant Surgeon, at least seven years of collegiate and professional training and appropriate experience are needed; for Senior Assistant Surgeon ten years. Active duty as a Public Health Service officer fulfills the obligation of Selective Service.

Application forms, which must be received completed in the Division of Personnel no later than October 13, 1956, may be obtained from the Chief, Division of Personnel, Public Health Service, Washington 25, D. C.

Survival of Coccidioides immitis Under Controlled Conditions of Temperature and Humidity

LORRAINE FRIEDMAN, Ph.D.; CHARLES E. SMITH, M.D., D.P.H., F.A.P.H.A.; D. PAPPAGIANIS, Ph.D.; and R. J. BERMAN

Laboratory studies are reported here that shed light on the peculiar regional distribution in nature of the fungus Coccidioides immitis.

Epidemiologic data have established that infections of Coccidioides immitis are associated geographically and seasonally with a dry, dusty environment.[1-7] Proved endemic areas are the arid and semiarid regions of the Western Hemisphere from our own southwestern states as the northern limit to northern Argentina at the southern limit. A few isolated cases have been reported from points scattered throughout the world, but some have been erroneous diagnoses and in certain instances the fungus may have been transmitted by fomites.[8]

The limitation of these endemic areas is not attributable to any common factor which has yet been identified other than this aridity. However, the common denominator of a brief rainy season followed by the dry, dusty season when most infections are acquired is not the sole requirement. Many regions, some even adjacent to an endemic area, are semiarid and dusty, yet coccidioidomycosis does not occur. Until we know how the fungus multiplies in nature, the basis for this sharp restriction in endemicity will continue to be a mystery. As a corollary to this geographical restriction of Coccidioides to arid areas and the consistent seasonal prevalence of human coccidioidal infections in the dry, dusty months,[2, 5] we have studied the survival characteristics of the infectious arthrospores of a single strain of C. immitis at different temperatures and relative humidities.

Methods

Preparation of Samples of Dry Spores—The Silveira strain [9] of C. immitis was cultivated in Petri dishes on a medium which consisted of 2 per cent glucose, 1 per cent yeast extract, and 2 per cent agar. When the agar was dry the spores were collected by suction. Sufficient samples for the entire experiment were prepared at the same time by weighing 50 mg of spores in small aluminum cups. These cups were prepared by molding ordinary household aluminum foil. Each cup containing spores was placed in a medicine glass which was then covered with parchment paper and secured with a rubber band. Aseptic technic was used throughout. Ten samples were assayed immediately for viability. The remaining samples were distributed among the various experimental environments.

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These investigations were conducted in part under the sponsorship of the Commission on Acute Respiratory Disease, Armed Forces Epidemiological Board, in part by the Office of the Surgeon General, Department of the Army, and in part by a contract between the University of California and the Office of Naval Research.

The opinions contained in this report are not to be construed as reflecting the views of the Navy Department or the Naval Service at large. (Article 1252, U. S. Navy Regulations, 1948.)

Preparation of Saline Suspensions—A portion of the stock lot of cells was suspended in physiologic saline solution and stored concurrently with the dry spore samples at the varying conditions of temperature. For over a decade we have observed the tremendous survival ability of coccidioidal spores suspended in physiologic saline solution. Therefore, we used these suspensions as indicators of the deleterious effects of these altered environments. For the −15° C temperature only, the suspension was dispensed into several small test tubes in order that one tube at a time could be thawed for assay. A single suspension, 10 ml in volume, was placed at each of the other temperatures and 1 ml removed at the time of assay.

Preparation of Brine Suspensions—Another portion of the same stock lot was used for testing the survival of Coccidioides in brine as a saturated solution of sodium chloride. Approximately the same quantity of spores was suspended in equal volumes of saturated and of physiologic sodium chloride solutions. The two saline suspensions of spores containing the same concentration of cells were paired for retention at varying temperatures. The physiologic saline suspensions again served as controls for the survival of the suspensions in brine solutions.

Preparation of Distilled Water Suspensions—Spores of the same strain, but of a different lot, were suspended in distilled water and in physiologic saline in centrifuge bottles. The final volume of each was approximately 100 ml and the final concentration of spores was 1×10^6 per ml.

Assay of Viability—The aluminum cup containing the dry sample to be assayed was wedged in the neck of an eight-ounce screw-top bottle containing 100 ml of buffered physiologic saline and glass beads. The screw cap was closed tightly. Quick agitation freed the cup and spores and shaking for two hours by a Kahn shaker resulted in a homogeneous suspension consisting primarily of single cells. The viability of cells was determined by preparation of three or five pour plates with one ml inocula of the appropriate logarithmic serial dilutions. Twenty to 120 colonies per Petri dish of six-inch diameter were considered desirable for counting.

Establishment of Conditions of Temperature and Humidity—Varying relative humidities were attained by adjusting the proportions of distilled water to concentrated sulfuric acid according to a graph (Figure 1) prepared by Kilbuck [10] from the data in publications by Wilson,[11] Shankman and Gordon,[12] and Collins.[13] A total volume of 200 ml of the solutions of sulfuric acid was placed in Pyrex desiccators having a gas capacity of 2.8 liters for the samples kept at constant temperature. Larger desiccators and proportionately larger volumes of the sulfuric acid solutions were necessary to accommodate the great number of samples used in the study with fluctuating environmental conditions.

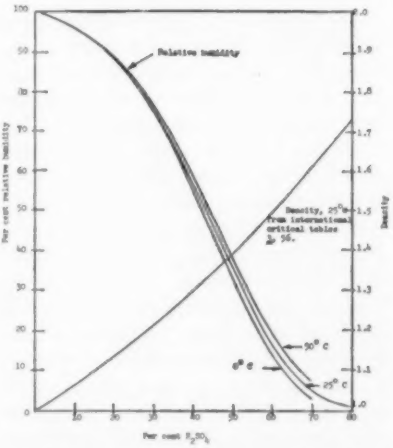

Figure 1—Relative Humidities at Different Temperatures with Varying Concentrations of Sulfuric Acid as Presented by Kilbuck [10]

At the temperature of −15° C, no effort was made to control the relative humidity but, although comparatively dry in terms of absolute humidity, the atmosphere was assumed to have approached saturation. The temperature designated throughout as 20°–25° C was not controlled but was actually the temperature of the room.

Preliminary Experiments—Prior to the experiments just described, pilot studies were carried out by essentially the same technic, but with a different lot of cells and at a less extensive range of conditions, viz., 4°, 20°–25°, and 50° C temperatures and 10, 50, and 95 per cent relative humidities. Only dry samples of 30 mg of spores were used and storage extended through one year.

Results

In the preliminary experiments with dry spores after 7 days at 50° C the viability dropped from an initial 16.9 x 10^6 cells per mg to 3.2 x 10^6, 5 x 10^6, and 1.3 x 10^6 at 10, 50, and 95 per cent relative humidities, respectively. By the end of the second week at this high temperature only two samples, at 50 and 95 per cent relative humidity, contained viable cells and these were < 100. However, at 4° C and at 20°–25° C, even after three months the number of viable cells had changed only slightly in the three relative humidities. Viability assays of the 4° C specimens were not repeated at the sixth month; instead the samples were held for one year. At this time samples showed a viability of 20 x 10^6, 13.7 x 10^6, and 3.6 x 10^6 per mg at the respective relative humidities of 10, 50, and 95 per cent. The decrease at 4° C, 95 per cent relative humidity, was not in agreement with the good results we usually observe at this condition, but a repeat check could not be made since the supply of samples was exhausted. At room temperature also the one year

Table 1—The Survival of 50 mg Samples of Dry Spores of Coccidioides immitis Stored at Constant but Different Temperatures and Relative Humidities

Temperature	Relative Humidity, Per cent	Viable Cells Per mg After Storage (x 10^6)			
		0	One Month	Three Months	Six Months
−15° C	100		11.0	10.0	14.3
	10		11.2	10.4	7.5
4° C	50		11.0	10.0	13.0
	95		15.6	11.6	11.3
	10		9.6	11.8	6.8
20°–25° C	50		12.6	12.5	13.2
	95		13.0	15.6	12.6
	10		7.8	0.4	0.000434
37° C	50		9.6	9.9	2.8
	95		13.0	8.7	7.4
Median		14.3 *	11.2	11.7	9.1
		[9.2, 9.8, 11.8 12.8, 12.8, 14.0 14.6, 14.6, 16.6 16.6, 16.7, 17.0]			

* This median value was derived from the individual values, in brackets, obtained by the assay of 10 random samples without storage.

Table 2—The Survival of 50 mg Samples of Dry Spores of Coccidioides immitis Stored at 20°–25° C *, 50 Per cent Relative Humidity, Concurrent with Those of Table 1, and Then Shifted Through a Variety of Conditions

Storage Conditions †		Viable Cells per mg ‡ (x 10^6)
	no further storage	9.2
	4° C 4 hours	13.4
	4° C 16 hours	13.6
1 month storage at	−15° C 4 hours	12.0
20°–25° C, 50 per cent	−15° C 16 hours	6.2
relative humidity	−15° C 16 hours, 37° C 30 minutes	10.5
followed by:	−15° C 16 hours, 37° C 16 hours	13.6
	−15° C 16 hours, 20°–25° C 50% RH, 7 days	4.7
	−15° C 16 hours, 20°–25° C 50% RH, 7 days −15° C 4 hours	1.1
	−15° C 16 hours, 20°–25° C 50% RH, 30 days	1.9
	no further storage	12.2
	no further storage	11.8
	no further storage	13.5
	no further storage	14.1
	4° C 4 hours	10.9
3 months storage at	4° C 16 hours	14.0
20°–25° C, 50 per cent	−15° C 4 hours	12.8
relative humidity	−15° C 16 hours	13.0
followed by:	−15° C 16 hours, 37° C 30 minutes	11.7
	−15° C 16 hours, 37° C 16 hours	12.0
	−15° C 16 hours, 20°–25° C 50% RH, 7 days	9.6
	−15° C 16 hours, 20°–25° C 50% RH, 7 days −15° C 4 hours	7.8
	−15° C 16 hours, 20°–25° C 50% RH, 30 days	9.8
	no further storage	9.7
	no further storage	8.4
	no further storage	6.4
	no further storage	9.1
	4° C 4 hours	10.9
6 months storage at	4° C 16 hours	12.5
20°–25° C, 50 per cent	−15° C 4 hours	1.5
relative humidity	−15° C 16 hours	11.2
followed by:	−15° C 16 hours, 37° C 30 minutes	11.5
	−15° C 16 hours, 37° C 16 hours	11.8
	−15° C 16 hours, 20°–25° C 50% RH, 7 days	2.2
	−15° C 16 hours, 20°–25° C 50% RH, 3 days −15° C 4 hours	4.4
	−15° C 16 hours, 20°–25° C 50% RH, 30 days	2.5

* 20°–25° C was actually room temperature.
† Except where specified, humidity was not controlled.
‡ Initial viability was 14.3 x 10^6 cells per mg.

counts were high, to 3.3 x 10^6, 16 x 10^6, and 18 x 10^6 per mg at the same respective relative humidities.

The above results were confirmed in the final but more extensive experiments on storage of dry spores as shown in Tables 1 and 2. When the storage conditions were held constant at −15°, 4°, or 20°–25° C, the number of viable cells was changed little even after six months, regardless of the relative humidity. At 37° C there was only a slight reduction from 14.3 x 10^6 to 8.7, and 7.4 x 10^6 after three and six months in the sam-

ples held in 95 per cent relative humidity. The samples in the environment of 50 per cent relative humidity showed no marked loss at three months, but viability was reduced to 2.8 x 10^6 at six months. However, with the 37° C temperature there was a relatively rapid loss of viability of those cells held at the 10 per cent relative humidity. Thus, the one-month viability of 7.8 x 10^6 for 10 per cent relative humidity was the equivalent of that of six months at 95 per cent relative humidity, reducing to 4 x 10^5 at three months and to 4.34 x 10^2 at six months.

As shown in Table 2, subjecting the dry spores to −15° C after prolonged storage at 20°–25° C and 50 per cent relative humidity did not affect the viability of the spores. Even subsequent brief exposure to 37° C did not reduce the number of viable cells. However, the spores were weakened. Subsequent storage, even in the "normal" environment of 20°–25° C and 50 per cent relative humidity reduced viability, in some instances to 2 x 10^6 per mg from the initial level of 14.3 x 10^6.

Tables 3 and 4 demonstrated the satisfactory survival of the spores suspended in physiologic saline and were in accordance with past experience. The optimal temperature for storage was 4° C as germination did not occur and there was no change in viability even after six months. As the temperature was increased, prolonged storage was less satisfactory. However, at room temperature viability was not reduced until between three and six months. With incubation at 37° C a decrease in viability usually was observed between the first and second month. Also, germination occurred and within one month a mycelial mat covered the surface. However, during the entire period of six months a heavy sediment of viable spores remained ungerminated. Although dry spores were not harmed by a temperature of −15° C, many of the spores suspended in physiologic saline solution and stored concurrently were killed immediately. Thus, counts made three hours after freezing showed a drop from 126 x 10^6 to 41 x 10^6 per ml and the sample which was not thawed until the sixth month showed a far greater drop to 5 x 10^2 per ml (Table 3). There was no change in the viability of spores suspended in water and stored at 4° C for 11 months.

The survival in saturated sodium chloride solution is shown in Table 4. Storage at the usual refrigerator temperature of 4° C showed no reduction in viability during six months. At the

Table 3—The Survival of Suspensions of Coccidioides Spores in Physiologic Saline Solution Stored Concurrently, at Varying Temperatures, with the Dry Samples of Tables 1 and 2

Temperature	0	Three Hours	One Month	Three Months	Six Months
−15° C *	126 x 10^6 †	41 x 10^6	4 x 10^6	3 x 10^2	5 x 10^2
4° C	" "	not counted	115 x 10^6	118 x 10^6	127 x 10^6
20°–25° C ‡	" "	not counted	133 x 10^6	142 x 10^6	3 x 10^6
37° C	" "	not counted	2 x 10^6	grossly contaminated	grossly contaminated

* −15° C stock suspension was divided into 5 ml volumes and stored in individual lots to prevent repeated freezing and thawing during assays. At the other temperatures, a single lot of 10 ml was stored and 1 ml removed at the appropriate time for assay.

† Viability is expressed as viable cells per ml of suspension.

‡ Room temperature.

Table 4—Comparison of the Survival of Spores of Coccidioides immitis in Saturated Sodium Chloride Solution (Brine) and in Physiologic Sodium Chloride Solution at Varying Temperatures and Intervals of Time

Storage Time	Temperature: 4° C — Viable Cells Per ml: Physiologic Sodium Chloride Solution (Control) x 10^6	4° C — Viable Cells Per ml: Saturated Sodium Chloride Solution x 10^6	20°–25° C * — Viable Cells Per ml: Physiologic Sodium Chloride Solution (Control) x 10^6	20°–25° C * — Viable Cells Per ml: Saturated Sodium Chloride Solution x 10^6	37° C — Viable Cells Per ml: Physiologic Sodium Chloride Solution (Control) x 10^6	37° C — Viable Cells Per ml: Saturated Sodium Chloride Solution x 10^6
< 15 min.	78	63				
24 hours	68	66	77	66	76	66
72 hours	80	69	75	60	68	64
1 week	71	68	74	53	72	61
1 month	80	65	79	65	53	53
2 months	78	57	60	54	1.6	0
3 months	63	63	64	51		
6 months	74	69	75	56	2.5	

* Room temperature.

room temperature of 20°–25° C suspensions in brine survived almost as well though there was gradual reduction from 66 x 10^6 to 56 x 10^6 at six months. At incubator temperature of 37° C survival was poorer in brine even than in physiologic saline. Parallel and slight reduction of viability in the first month was followed by the marked reduction of survival previously noted during the second month of the specimen in physiologic saline and by death of all of the spores stored in brine.

The resistance of spores of Coccidioides to adverse conditions is borne out by these studies. Of the varying environments tested, only high temperature and low humidity appeared deleterious. Since this combination is observed in the endemic coccidioidal areas, at quick glance it might seem incompatible with the ecology of the fungus. However, one recalls that not only is such a combination only seasonal but also that it is only diurnal. During the nighttime, temperatures are chill and relative humidity moderate to high. The fact that the spores are able to survive even for short periods at high temperatures and low relative humidities can well explain how the fungus is able to persist during the summer and fall to the rainy season of the following winter.

Furthermore, the dry spores demonstrated a far greater capacity for survival under adverse conditions than did the wetted spores. Thus, though there was a gradual loss in viability even of the dry spores at 37° C in low relative humidities, those suspended in physiologic saline suffered a one log drop at the end of the month. The superior survival of the dry spores was indicated by conditions which would probably be exotic to the biology of the fungus. Thus freezing and thawing was deleterious to the suspended spores and at −15° they gradually declined in viability, whereas the dry spores showed no diminution in survival.

Whether the survival capacity of C. immitis is unique among pathogenic fungi is not known, since we know of no completely comparable studies. Ritter [14] has demonstrated a long sur-

vival time (621 days at 4° C) for Histoplasma capsulatum suspended in sterilized tap water, but the percentage of viability was not stated. Parenthetically, in the course of routine investigations in this laboratory, we have maintained C. immitis in physiologic saline solution at 4° C for three years. However, the viability is now only approximately 5 per cent of the original material. Moreover, a great portion of it is now mycelial. Others [15–17] have included survival of H. capsulatum in their studies but, again, the data were not quantitative.

The extraordinary ability of the fungus spores to survive a continuous exposure to saturated solution of sodium chloride also is indicative of its resistance to environmental rigors. One recalls that brine flotation was employed by Stewart and Meyer [18] in the first recovery of Coccidioides from the soil, but the exposure was relatively transient. Although the cells which we suspended in brine and stored at 37° C eventually died and at a greater rate than did companion spores in physiologic saline, their survival for even a month at 37° C and their prolonged survival at room and refrigerator temperatures bespeak the hardiness of the spores. The observations support the concept of a strongly selective cell wall, one which also makes wetting and suspension of the spores difficult without forceful agitation. Indeed, these are spores well adapted to survive the environmental rigors of their arid habitat.

Summary

Dry spores of Coccidioides immitis were stored at −15°, 4°, 20°–25°, and 37° C with relative humidities of 10–95 per cent. There was little loss in viability at any of the temperatures less than 37° C until the sixth month at which time the count decreased not more than 50 per cent of the initial 14.3 x 10^6 viable spores per mg. Low relative humidity (10 per cent) coupled with high temperature (37° C) was deleterious, but six months elapsed before all of the spores were dead. After one week at 50° C there was a 15-fold drop and by the second week all spores had died.

Extended storage of dry spores followed by subjecting them to extremes of temperature also resulted in little loss of viability unless these rigors were followed by a second storage. Then there was a rapid 10-fold loss of viability.

Storage of spores suspended in physiologic saline solution was less successful in that survival was satisfactory only at temperature ranges from 4° to 20°–25°. Freezing at −15° C caused an immediate threefold reduction in viability followed by additional gradual loss. Storage at 37° C resulted in mycelia formation and after a month a reduction to one-tenth the initial viability level.

Spores suspended in distilled water remained viable at 4° C through an observation period of 11 months.

Spores suspended in saturated sodium chloride solution survived quite well. After six months at 4° C there was no loss of viability and little loss at 20°–25° C. At 37° C the rate of dying was more rapid. While no loss of viability was evident after one month, at the end of two months no spores were viable.

Conclusion

The survival of the spores of Coccidioides immitis for six months in many environments, from −15° C through 37° C and a variety of humidities, further evidences the successful adaptation of the fungus to the rigors of its arid habitat.

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A National Library of Medicine

President Eisenhower has signed the bill creating the National Library of Medicine in the Public Health Service. The functions of the present Armed Forces Library will be carried out by the Service with the advice and recommendation of a 17-member Board of Regents. Ten are to be appointed by the President with the consent of the Senate for a four-year term; seven are ex-officio members—the Surgeons General of the Public Health Service, the Army, the Navy, and the Air Force, the Librarian of Congress, the chief medical director of the Department of Medicine and Surgery of the Veterans Administration, and the assistant director for biological and medical sciences of the National Science Foundation. Location of the library will be decided by the Surgeon General of the Service after consultation with the Board of Regents.

A Serologic Survey of Influenza and APC Virus Infections

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As the authors point out, the study reported upon here will serve as a base line upon which findings of similar surveys in years to come may be judged. We think many epidemiologists will be interested in establishing their own comparable base lines.

The present study is the third undertaken in the division to learn whether the routine blood specimens which steadily flow into the laboratory carry useful epidemiologic information. The first study was made in the winter of 1945–1946.[1] More than 300 pools of five sera each were periodically collected and tested with allantoic fluid influenza antigens. The results suggest that little influenza A virus infection had occurred during the winter, but that sporadic epidemics of influenza B virus infection had been present. High titers of influenza B antibody were found following reports of outbreaks of acute undifferentiated respiratory infections during December.

The second study, in 1952–1953,[2] was made in anticipation of a predicted epidemic of influenza A. Sporadic outbreaks evidently did occur and the randomly collected sera again gave consistent results. Elevated influenza A antibody titers were frequently encountered. In this study soluble antigen replaced allantoic fluid and the sera were examined individually. Both of these changes were advantageous.

The present study covers the winter of 1954–1955. In addition to influenza A and B, the specimens were tested for complement-fixing antibodies for the APC (adenoidal - pharyngeal - conjunctival) group of viruses.[3-11]

Materials and Methods

The quantitative complement-fixation test devised by Wadsworth and Maltaner[12] was used, with the modifications made in the 1952–1953 study. The specimens were portions of sera that had been submitted for tests for syphilis and had not reacted with cardiolipin antigen. Collections were made to represent the eight regions used in the original survey.[1] In all, 388 sera were tested. Each was first screened in a 1:4 dilution with the three antigens and reacting sera were retested to determine the titers. The fixation period was 24 hours at from 3° C to 6° C for both tests.

The APC antigen consisted of infected tissue culture (HeLa) fluids.[3, 4] Two modifications were introduced. The virus was left on the cells for a longer period and the contents of the bottles were quickly frozen and thawed. A pool composed of aliquots of APC antigen Types 1–6 was used in the serologic tests. The antigen was inactivated for 30 minutes at 56° C each time before it was used.

Standardization of Antigen — The range of activity of the antigen was determined with an immune serum of known activity. The optimum dilution was that which gave the highest titer in the absence of any anticomplementary

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Table 1—Titration for Linearity Between Serum and Complement Performed with APC Antigen and Immune Serum

Immune Serum Dilutions (0.05 ml each)	Equivalent ml of Serum	APC Antigen Dilutions in Optimum Range											Maximum No. of Units of Complement Required for 50 Per cent Hemolysis [12b]
		1:2	1:4	1:8	1:1.33	1:2.67	1:5.33	undil.	1:2	1:4	1:1.33	1:2.67	
		Per cent Hemolysis Observed with Units of Complement											
		3u	3u	3u	4.5u	4.5u	4.5u	6u	6u	6u	9u	9u	
1: 5.55	0.009										10	100	11.5
1: 8.33	0.006										30	90	10.0
1:16.7	0.003				0	10	75	25	30	75	**70**	100	7.9
1:25	0.002				10	10	55	55	**45**	80	90	100	6.2
1:33.3	0.0015	0	0	25	45	25	80	80	**70**	95	100	100	5.2
1:41	0.0012	5	15	30	60	**35**	75	95	85	95	100	100	4.9
1:50	0.001	10	**10**	25	80	55	80	100	100	100			4.5
1:55.5	0.0009	20	**15**	80	90	70	85	100	100	100			4.1
1:62.5	0.0008	25	**15**	55	100	80	95	100	100	100			4.1
1:83.3	0.0006	55	**25**	75									3.7
1:100	0.0005	85	**40**	75									3.2

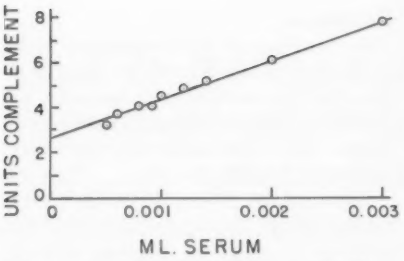

Figure 1—Complement-Serum Relationship APC Antigen

properties. Dilutions which gave less than 90 per cent hemolysis with two 50 per cent units of complement in the absence of immune serum were considered unsatisfactory.

Linearity between serum and complement was determined by using proportionally increasing amounts of serum and antigen with varying amounts of complement. The dilutions were chosen on the basis of the range test just described. An example is shown in Table 1. Figure 1 represents the titration. The dilution already chosen as optimum for three 50 per cent units and those for four, five, six, and nine units gave the maximum degree of reaction. The linearity obtained indicates that the conversion factors determined for the complement-fixation test for syphilis apply fairly well to the APC antigen.[12a]

Tests were then made with three 50 per cent units of complement and three dilutions of the antigen in the optimum range with serial twofold dilutions of sera from patients with respiratory symptoms. The amount of antigen producing maximum fixation may vary with different human sera. The average optimum dose (1:4) was used. This amount may be expected to give titer values within 25 per cent agreement when calculated from partial points of hemolysis obtained with different amounts of serum. Excess or deficient amounts of antigen may give atypical results and usually do not produce the maximum titer. Thirty-one sera were tested with three amounts of APC antigen. The titers ranged from seven to 60 with the exception of one which was greater than 200. This patient had served at Fort Dix where Dr. Hilleman had conducted his studies of military personnel.[6] His serum was used as a positive control.

Results

The data are shown graphically in Figure 2. On the basis of our experience in the first two surveys we assume that influenza A and B virus infections were infrequent during the period of observation. The titers obtained probably represent residual antibodies developed during subclinical or previous infections. The presence of APC virus antibodies in high titer suggests that infection with these agents was most prevalent. During February 80 per cent of the sera reacted strongly with the APC antigen and in approximately one-half the titers were greater than 50. Since we have thus far had little opportunity

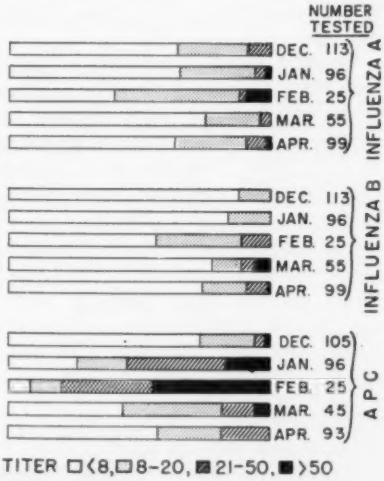

Figure 2—Range of Complement-Fixation Titers in Sera Collected from December, 1954–April, 1955

to determine the degree of antibody response following proved infections, the significance of particular titers is uncertain although the changes seem to be meaningful.

Figure 3 shows the eight regions of the state. In each case reacting sera were widely distributed.

Discussion

The epidemiologic value of surveys of this kind remains to be proved. So far the results have conformed rather well with clinical information. What has been done provides a base line which may be helpful in judging results in other years. While the sera are randomly selected they are drawn from an arbitrarily determined group, namely, young, healthy adults whose sera come to the division in a constant flood for purposes of employment or premarital testing. This group has been selected to avoid the complexities of hospitalized patients and because the source of material is large and most nearly uniform. The possible value of such sampling may more likely become clear from continued experience than from closer analysis.

Sporadic cases of influenza A infection seem to have been commonplace in each of the three years. Neither influenza A nor B has been as prevalent as APC virus infections seem to have been during the winter of 1954–1955.

Figure 3—Map of New York State Showing the Eight Medical Regions

Conclusions

A third survey for respiratory virus antibodies in random New York sera has provided evidence of sporadic influenza A and influenza B virus infections. APC virus antibodies were more frequently found.

The sera sent to public health laboratories, though not representative of the population of given regions, provide means for learning something about the prevalence of respiratory virus infections.

The quantitative complement-fixation test has been applied to the APC virus system.

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Foods for the Upper Age Group and Nutritional Implications

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Nutritionists in the field should find uses for the facts about sizes of servings that are reported here. Research people, too, should find suggestions about evaluating dietary data—among others equally useful.

Information about foods eaten by older people, in relation to nutritional status, has been coming recently from regional research conducted cooperatively by Western and North Central regional groups of Experiment Stations and the Human Nutrition Research Branch of the Agricultural Research Service. Studies have now been published giving information on people in California, Iowa, Michigan, Missouri, Nebraska, South Dakota, and Wisconsin. The Public Health Service and state and local health agencies cooperated actively in the California studies.

The people studied were "well" rather than "sick" people; they ranged in age from 30 to over 90 years; and their food intakes, except for one group in a County Home, represent those of people managing their own affairs and buying foods and services. Their choices were undoubtedly influenced by levels of income, intelligence, education, experience, habits, and market offerings.

Calcium—and Milk

Women collaborating in a coordinated metabolic study in five of the North Central states (Iowa, Michigan, Missouri, Nebraska, and Wisconsin) showed the highest average calcium intakes. This North Central group met the National Research Council's allowances, except for the women 70 years or older, whose average fell somewhat below. Each of these women lived close to one of the cooperating experiment stations. Ohlson and her colleagues [1] reported that about one-seventh of them were of low but not indigent economic level, about three-fifths were at least comfortably situated as to buying power, and the remainder (somewhat more than one-fourth) were of upper socioeconomic status. It seems reasonable therefore to look upon the relatively high average intakes of this group as representing for the most part choices of people who could afford to buy milk products and other sources of calcium if they desired.

Women selected, by means of area sampling, as representative of all women 30 years old and over in the states of Iowa [2] and South Dakota [3] reported diets which for each age decade were considerably lower than the NRC allowances for calcium.[4] A U. S. Department of Agriculture Study [5] of homemakers in three cities (Buffalo, Minneapolis-St. Paul, and San Francisco) showed averages for each decade similar to the Iowa and South Dakota figures.

The average intake for the North Central group, all ages combined, was more than the NRC allowance of 0.8 gm; whereas the average intake for the

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Iowa and South Dakota state samples was only 0.5 gm, and for the homemakers in three United States cities was only 0.6 gm. There was wide variability among individuals, however.

Calcium balance figures are available for the North Central group and are of interest as an aid in evaluating current dietary allowances. For this purpose the data have been summarized in Table 1 by level of calcium intake for each decade. It is apparent that until levels of intake were at least as high as 0.9 gm (the NRC allowance is 0.8 gm), the average calcium retentions for most decades were negative.

A breakdown by calcium intake in the previous 24 hours for women in the cross-sectional samples of Iowa and South Dakota indicated that 5 per cent of the Iowa women and 13 per cent of the South Dakota women took less than 0.2 gm calcium—or less than one-fourth of the National Research Council's recommended allowance for calcium; about a third of the women in both states took less than half the allowance; and about 40 per cent took between one-half and the full allowance. At similar calcium intake levels the balance data on the selected group of North Central women showed consistent calcium losses. It may be inferred that if balance studies had been possible on the Iowa and South Dakota state samples, negative balances would have been found for many of the subjects. Less than one-fifth of the women in either state took as much calcium in the day as is recommended by the National Research Council.

Table 1—Relationship of Average Calcium Intakes to Calcium Retentions of North Central Women, by Age-Decades from 30 to Over 70 Years

Intakes	Retentions
Less than 0.49 gm	All decades negative
0.50–0.89 "	Most decades negative
0.90–1.09 "	Most decades positive
1.10–1.29 "	All decades positive

To see what might account for the low calcium intakes of the women in the Iowa state sample Swanson and Willis analyzed the diets of their subjects in various ways. They found that about 30 per cent of the women of all decades reported no milk taken in the 24 hours before they were interviewed; approximately another 30–40 per cent reported some milk but less than one cup; and about 20 per cent took from one cup to less than two cups. Except for the 30 to 39-year-olds only 12 per cent took two cups or more. According to the U. S. Department of Agriculture's food composition tables,[6] one cup of milk provides slightly less than 0.3 of a gm of calcium, even two cups of milk (or about three ounces of cheddar cheese) provide less than 0.6 gm. The Iowa report demonstrated that, with the pattern of eating of these women it is difficult to plan a diet without milk or cheese which will provide even 0.3 gm of calcium.

To sum up the calcium studies: women representing a cross-section of two midwestern states and three large United States cities ate on the average, during a 24-hour period, far less calcium than the National Research Council allowances and reported very low intakes of milk. Also, a selected group of North Central women, although showing a relatively high average intake, contained individuals with calcium intakes far below recommended levels.

These findings provide good reasons for public health workers, community nutritionists, teachers, and other leaders to encourage calcium intakes at least as high as the National Research Council's daily allowances. There seems also to be good nutritional, as well as business reasons, for producers and processors of calcium-rich foods, notably milk and cheese, to seek ways of improving products and increasing sales. For in-

stance, one recent accomplishment is the retailing of nonfat milk solids in the new fast-dissolving forms. Such products add to convenience and economy under many circumstances and have an added attraction for overweights who are reluctant to take much milk, cream, and cheese because of the calories from the fat they contain.

Vitamin C—and Fruits and Vegetables

Morgan, Gillum, and Williams [7] reported on men and women living in their own homes in San Mateo County, Calif. On the average they recorded intakes of foods supplying considerably more vitamin C, or ascorbic acid, than the National Research Council allowances for men and women, respectively. However, men over 60 in the San Mateo County Home had low intakes. Intakes of the women in South Dakota were somewhat below the National Research Council allowance for ascorbic acid in all age decades up to 70 and, after that age, averaged only half the recommended ascorbic acid intake.

Table 2 compares the average intakes, regardless of age, for several groups on which data are available. The average intakes of men and women in the San Mateo County study and of the women in the San Francisco, Calif., study were all relatively high. The intake levels for women in the Midwest, South, and Northeast averaged 10 per cent below the National Research Council allowance for women. The state sample in South Dakota is somewhat lower. The contrast between the 99 mg average intake of California men living in their own homes, and 40 mg average for California men in the County Home is striking.

Availability of citrus fruits and other rich sources of vitamin C on the West Coast would appear to have been a factor in the relatively high average intakes of men and women living in their own homes. Even in California, whether because of cost, management problems, cooking practices, or food habits, the institutional diet was low in vitamin C.

The South Dakota data indicated that more than half the ascorbic acid came from vitamin-rich vegetables and fruits and almost one-third from potatoes. About one-tenth came from other fruits and vegetables. No analysis of the data has been released showing vitamin C-rich foods as a separate class. However, within the vitamin-rich fruit group, tomatoes were included and were used as much as any other single fruit;

Table 2—Average Ascorbic Acid Intakes of Different Population Groups

Sex and Location	Age Range	Intake mg
Men, San Mateo County, Calif.	50–75 and above	99
Women, California	"	86
" San Francisco, Calif.	Under 29 to over 60	81
" Minneapolis-St. Paul, Minn.	"	66
" Birmingham, Ala.	"	64
" Buffalo, N. Y.	"	62
" South Dakota	30–70 and above	55
Men, San Mateo County Home, Calif.	60–75 and above	40

peaches came next, followed by oranges, grapefruit, and berries.

In Iowa, Swanson and Willis [8] examined the diets of 28 women who met the National Research Council's allowances in all respects including vitamin C. These women averaged five and one-half servings of fruits and vegetables a day; whereas all 1,072 Iowa women in the study averaged only three and one-half servings. When only vitamin-rich fruits and vegetables are considered these 28 women ate twice as many servings as the others—3.7 as against 1.9.

Among the San Mateo County subjects metabolic data were studied in relation to ascorbic acid intakes. There was a definite relationship between serum ascorbic acid levels and vitamin C intakes and also between the serum levels and lack of teeth or gingivitis. At serum ascorbic acid levels of less than 0.5 mg about one-half had no teeth; of the people who had teeth, there were almost as many with gingivitis as with healthy gums. At a higher serum level, 0.5 to 1.09, about 40 per cent had no teeth, and only one-third as many of the people with teeth had gingivitis as had healthy gums. With serum levels above 1.1 only one-fourth as many of the subjects had gingivitis. Fifty per cent of the group at the lowest serum ascorbic acid level had gingivitis. Approximately 55 per cent did not have it; the remainder, about 32 per cent, were edentulous.

The relationship of serum ascorbic acid values to economic level was explored by Morgan and Gillum on the people in San Mateo County, Calif. Serum ascorbic acid levels were lowest for those in the low economic group—the men in the County Home. The people on relief and assistance rolls showed somewhat higher levels, those of the middle income group still higher, and those of the highest income level had the highest serum ascorbic acid levels.

To sum up the vitamin C findings, keeping the serum ascorbic acid high may save teeth. The low levels of intake observed in many parts of the country make it appear that foods rich in vitamin C need to be made more attractive to adults. Availability, cost, convenience are all factors to be explored. For instance, it would appear that frozen and dried citrus concentrates and other dependable year-round sources of vitamin C deserve more attention.

Food Intake Patterns

The frequency of appearance of designated food groups in the 24-hour intakes reported by women in the Iowa sample [9] is shown in Table 3. More than 90 per cent of the women had eaten fats; bread or other cereal products; meat, poultry, or fish. (Actually 99 per cent reported fats and 98 per cent grain products in the previous 24 hours.) From 70 to 89 per cent had eaten white potatoes and desserts other than fruit. From 50 to 70 per cent had eaten vitamin-rich vegetables and fruits; other vegetables; eggs, cheese, and legumes; and fluid milk. Less than 50 per cent had had fruits other than the group classed as vitamin-rich. From this grouping of food intakes it is apparent that the most popular kinds of foods among the Iowa women, in broad terms, were fat, bread, meat, potato, and desserts other than fruit.

Burrill found that in the diets of the women in the South Dakota sample 60 per cent of the desserts were "made"—with cakes leading in popularity, cookies next, and pies next. Total fat in the South Dakota diets was estimated at 40 per cent of the calories, 19 per cent coming from table fats. Whereas there was a decrease of average energy intake with age, there was no consistent drop in the percentage of total calories from major food groups. Sweets and desserts were the chief

Table 3—Percentage of 1,072 Iowa Women Reporting Use of Designated Food Groups in Preceding 24 Hours

90 Per cent and Above	From 70–89 Per cent	From 50–69 Per cent	Below 50 Per cent
Table and cooking fats	White potatoes	Vitamin-rich vegetables	Other fruits
Bread and cereals	Made desserts	Vitamin-rich fruits	
Meat, poultry, and fish		Other vegetables	
		Eggs, cheese, and legumes	
		Fluid milk	

source of energy, then cereal products, then table fats. More than 60 per cent of the calories came from these sources. Since overweight was found to be a major problem in the Iowa,[10, 11] South Dakota, and North Central groups, and in men and women over 50 in San Mateo County, Calif.,[12] these indications of popularity of relatively high calorie foods should serve a good purpose in suggesting ways to prevent and control overweight through diet.

The above mentioned findings about the kinds of food people eat have implications for—and often may be directly applicable to—groups in other geographic locations. For instance, overweight has in several published reports seemed associated in many individual cases with unexpectedly low values for recorded or recalled food intakes. It is often suggested that the low values are actually underestimates (conscious or subconscious) of the actual food eaten. If this is true, the predominance of high calorie foods in the diets reported by the Iowa women, including those who were overweight, seems somewhat paradoxical. However, perhaps where underestimations are reported it is in quantitative rather than qualitative aspects of the report—or in the quantities assumed as normal servings by the scientists calculating the nutritive value of the diet.

Recognizing that for nutritional evaluation of diets the amounts, as well as the kinds of food must be known, one part of the North Central cooperative project was directed toward establishing characteristic sizes of servings through determining the weights of foods eaten in one meal. A regional publication [13] presents the weights of servings in self-selected diets of 242 women ages 30–92 years. The number of daily records per subject ranged from five to 70; the total number of records was 3,170. States cooperating were Iowa, Michigan, Minnesota, Nebraska, South Dakota, and Wisconsin. Of the foods which appeared a sufficient number of times to justify a study of portion size, the number of servings ranged from 41 for lamb to 5,152 for bread.

In spite of wide variation of weights of a given food selected by the same subject at different meals, and between weights eaten by different subjects, the mean and median amounts were similar. Mean serving weights and distribution of weights were fairly similar from state to state. Some, but not all, of the variations among states, on numbers of portions eaten, could be explained by the supply of a particular food within a

state. After age 70 decreases were apparent in most portion averages. However, the amounts of sugar and cream added to beverages and the amounts of table fat used increased after the age of 50.

On the basis of the findings from this study some figures for portion weights were suggested by the research leaders as fairly characteristic of women aged 30 up to 70. These figures were offered as an aid to those desiring to use records of "servings" as a basis for estimating the nutritional values of diets and for suggesting and carrying out programs for nutritional improvement. The suggested porton weights for meats range from meat loaf, 90 gm, down through steak, chicken, fish, lamb, and veal (except chops), to ground beef and liver at 70 gm, then through chops and roast beef to frankfurters and pork (except chops) at 60 gm, then through ham and luncheon meat to bacon at 15 gm. There is room for a lot of study as to the role played by different factors, such as yield of edible material, texture, flavor, cost, availability, and convenience.

Suggested portion weights for vitamin-rich vegetables range from relatively large portions for tomato juice and cooked tomatoes, 125 and 110 gm, respectively, down to portions of 60–70 gm for a number of vegetables—asparagus, spinach, peas, parsnips, corn, cauliflower, and snap beans. Portions for cooked carrots and raw cabbage are about 55 gm. Potatoes cooked in different ways showed interesting differences. The suggested portion weight of scalloped potatoes, 120 gm, is approximately twice that of french fries, while, in between baked, creamed, mashed, boiled, and American fried potatoes appear in decreasing order.

Table 4 shows miscellaneous foods with a wide weight range. According to the Department of Agriculture's food composition tables the 215 gm portion for milk represents about nine-tenths of a cup, and the 85 gm for cereal cream or milk is about one-third of a cup. The bread is equivalent to about one and one-half slices. The coffee cream to about one tablespoon, the sugar for coffee or cereal, about two teaspoons, and the table fat about one-half tablespoon or one pat.

Table 4—Portion Sizes—Grams of Miscellaneous Foods as Served—Suggested for Women Under 70 on Basis of Daily Records of North Central Women

	Gram
Milk—beverage	215
Cream or milk—cereal	85
Bread	35
Cream—coffee	16
Table sugar	8
Table fat	7

One note of warning: suggested portion sizes help to characterize, or to anticipate, consumption by a group. In interpreting individual diets the wide variability in what may be reported as a serving must be kept in mind. For example, for ground beef the suggested portion is 70 gm. The actual average of all weighed portions was 75, the average for all subjects was 69, and the range for all portions was from 15 to 308 gm. In several instances the same women recorded both the largest and smallest amounts of a food eaten.

Summary and Conclusions

In summary, these findings indicate that the average calcium intake of a selected group of North Central women was no more than enough to prevent loss of calcium from the body. Intakes only 60 per cent as high, on the average, by cross-sectioned samples of the adult female populations in Iowa and South Dakota and only 72 per cent as high by the homemakers in three large cities may be dangerously low. It would seem from the results cited that ascorbic acid

intakes of older people may often be too low to promote satisfactory serum ascorbic acid levels and to maintain healthy gums. The metabolic data from these studies provide additional information as to critical levels of calcium and ascorbic acid intake. The new facts cited as to sizes of servings taken by women of different ages—and the frequency with which various kinds of food were reported in women's diets—will find many uses.

For research workers the findings from these studies provide additional tools for evaluating dietary data, for improving methodology both in the field and in the laboratory, and for planning new research to answer the many questions still in our minds. For community nutritionists and teachers the information would seem to provide support for continued emphasis on milk and vitamin-rich fruits and vegetables, as food sources of nutrients found lacking in many of the older peoples' diets. The type of data made available should also be of great practical interest to those concerned with various aspects of food processing, food service, and food habits.

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The Giver's Dilemma

The tide of public interest in health is flowing swiftly and vigorously at a time when the United States has reached a new high mark, and when expressions of concepts of the whole person and the whole family may be heard in the same corridors with the "Fund-for-a-Disease." There are many unsolved problems of vital concern to mankind and there are numerous untilled fields which call for continuing research coupled with education. The president of the Rockefeller Foundation in 1949 referred to the long activity in the field of public health as "a classic example of the coalition of medical science, natural science, and some aspects of social science toward a common goal." A great foundation's president has also been quoted as stating that to exalt one disease "to get it out of focus and to urge it at the expense of the other essential factors is unscientific, wasteful, and misleading." *

Is there more opportunity for cooperation among voluntary health agencies, which have earned a distinguished place and made such large contributions to the advancement of public health, as complements to the essential services of official organizations? Can more steps be taken in a manner to prove mutually beneficial without unwisely restricting fundamental programs? Can there be constructive interpretation and wider mutual understanding?

Of current and continuing interest to public health people is the running controversy between proponents of the United Fund idea and advocates of the independent national health agency appeal.

Out of the welter of arguments and counter arguments appearing in public print and being voiced in daily conversation, there may well be important and fundamental implications for long-range public health planning. Admittedly, this is a subject concerning which strong emotions are generated. Local citizens seeking more orderly giving patterns in their own communities range from frustration to active hostility in their reactions to what they consider as "inflexible and adamant" national health agency policies. The "independents" among the health agencies argue that they can grow faster and prosper more rapidly when they develop their own fund-raising machinery and refuse to join in local federated drives.

The authoritative study by Selskar Gunn and Philip S. Platt, "Voluntary Health Agencies," completed in 1945, raised serious questions about the position of the voluntary health agencies. Undertaken by the National Health Council and

* Quoted from the Survey of Medical Research (Vols. I and II). Published for the American Foundation, by Little, Brown, Boston, Mass., 1956.

financed by the Rockefeller Foundation, this three-year study, created at considerable cost and effort, has been stimulating in some quarters but a "prophet without honor" in parts of the voluntary health field. Perhaps it was ahead of its time, since the problem which it emphasized has grown so great that it has now reached the stage of public reckoning. Since 1949, when Detroit, Mich., organized its Torch Drive, the United Funds have grown to approximately 900 in the United States. These organizations have been created by the givers of as many communities to include, in addition to the Community Chest agencies and often the Red Cross, many other national campaigns. At least one refused to participate in any of these, and two or three other national organizations closed the door to further participation after several hundred local affiliates in each instance had entered United Funds.

In many of the other United Fund communities, even in those as large as Pittsburgh, a clash developed between the local citizens normally called upon to contribute to all causes and to raise funds for them and these "independent" agencies. This friction has ever more widely eddying effects. Medical journals and medical societies have taken positions in the matter.† There are those who are concerned with the charges of misleading financial statistics leveled by many communities at important national health agencies. They fear that such statements may tend to reflect upon the authenticity of program statistics issued in important health areas. Nevertheless, when important local citizens and their organizations raise such questions in numerous communities, there must be a better answer than mere repetition of the same figures in fuller voice.

When the business and industrial community, both labor and management, in a rapidly increasing number of communities have taken the position that there is a better way through which their gifts can be contributed, they must be taken seriously. United Fund cities, which have included large national agencies, report an average of 20 per cent more raised in their first united drive than the total raised by the included agencies in independent drives the preceding year. Reliable figures indicate that these United Funds continue to grow and in no way limit giving. In fact, it is reported that 13.4 per cent more money was provided to a specific national health agency in 1956 than in 1955 by 127 United Funds in which its local units were included. Did it do as well elsewhere?

The clash seems to be between the givers, who may be all of us, in Detroit, New Orleans, or Pittsburgh, for example, and the national health agency which should likewise be all of us, but which speaks with a voice chiefly "from New York City" to tell us how its national policy requires that our individual gifts should be made. When we have elected otherwise, as these cities have done, we have what has been dubbed popularly, "The Giver's Dilemma," or the "Fund-for-a-Disease Problem."

Somewhere, somehow, in a statesmanlike way in which other important national problems have been solved, there is an answer which is above acrimony and epithet and worthy of the great objectives which these national health agencies and the local United Funds seek to achieve. Perhaps the Gunn-Platt report, ahead of its

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† For example, the American Academy of Pediatrics Executive Board in the recent meeting in Houston passed two resolutions which were sent to labor organizations, the United Fund Organization, the United States Chamber of Commerce, and others. The resolutions: (a) expressed recognition of "the inherent difficulties and disadvantages of the present multiplicity of drives and demands for funds for individual diseases and urged continued and further study of ways and means of solving this problem equitably"; and (b) urged the adoption of a method of utilizing an equitable portion of the funds collected by the health agencies for combatting specific diseases to support medical education and basic research. . . ."

time, will still provide an indication of the cooperative way in which these issues can be resolved for the benefit of the people.

"But somehow 'tis seldom or never
The two hit it off as they should.
The good are so harsh to the clever
And the clever so rude to the good."

The British Public Health Centenary

In mid-May the leaders of the public health profession in Great Britain gathered in London to celebrate the centenary of the Society of Medical Officers of Health, for it was on May 13, 1856, that the London medical officers of health met to form the nucleus of the Society in what was first known as the Metropolitan Association of Medical Officers of Health. Its first president was the great leader, Dr. (later Sir John) Simon. Over the years the body has become nation-wide and is one which has strong professional ties with the American Public Health Association.

The program of celebrations this year was both scientific and social and included excellent historic exhibitions at the London School of Hygiene and Tropical Medicine under Professor A. Bradford Hill, dean, and at the Wellcome Historical Medical Museum under its director, Dr. E. Ashworth Underwood. Lord Adrian, world-famous physiologist, gave the centenary oration on "The Organizers of Health," and the presiding officer was the genial Dr. Charles F. White, just retiring after long service as medical officer of health for the City of London. A series of open forums were held on poliomyelitis, smoke abatement, cooperation with general practitioners, cerebral palsy, preventive dentistry, and health education.

All who attended enjoyed the evening receptions given the Society members "and their ladies," by the London County Council and its hospitable medical officer of health, Dr. John Scott, successor to Sir Allen Daley, and by the Council of the British Medical Association. Never to be forgotten, especially, was the magnificent Mansion House banquet on May 15 given by the Lord Mayor and Corporation of London for 300 members of the Society and their wives, Ministers of the Crown, and representatives of other medical and allied societies.

The guests in full regalia with their decorations, the gold plate, and the Loving Cup Ceremony all were truly British in their pomp and splendor. Here, as throughout the entire centenary, the kindly humor of all the speakers was noteworthy. England put on a most non-British drought, which called for corrective measures, and the only slightly dour note was a statistical warning from Professor Bradford Hill that life expectancy of the 100-year-old was only a year and a half.

The Executive Board of the American Public Health Association sent a formal official greeting to the Society of Medical Officers of Health on its centenary and this was read at a Society meeting on May 15 by Dr. Huntington Williams, commissioner of health of Baltimore. The text has appeared on an earlier page in this volume.[1] At the same meeting Dr. Williams was elected an honorary fellow of the Society. He had on the previous day delivered a curtain-raiser for the centenary week, on "The Influence of Edwin Chadwick on American Public Health," [2] as a Chadwick Public Lecture. This meeting was jointly convened by the Chadwick Trustees and the Section of Epidemiology and Preventive Medicine of the Royal Society of Medicine.

1. A.J.P.H. 46:859 (July), 1956.
2. M. Officer XCV (May 18, May 25, and June 1), 1956.
3. Brit. M. J. 4975: 1091 and 1102 (May 12), 1956.

Books and Reports

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Selected Papers of Joseph W. Mountin, M.D.—Joseph W. Mountin Memorial Committee. New York: American Public Health Association (1790 Broadway), 1956. 356 pp. Price, $5.00.

There could hardly be a more appropriate memorial to a great man in the public health movement than this volume of Dr. Mountin's selected papers. Better than any statue, painting, or building could possibly do, this collection shows us Dr. Mountin as he really was—and it is a very impressive showing, indeed.

Dr. Mountin's life (1891–1952) fairly well spanned the most productive years of public health in this country. The papers brought together in this volume cover a period of more than twenty-five years in Dr. Mountin's career, from 1925 to the year of his death. They show clearly what all who knew him were well aware of, namely, that he, like countless others, was a devoted, selfless, hard-driving worker in the cause of public health but that, like few others, he was always looking ahead, analyzing trends, pointing in new directions. As early as 1925, for example, he was speaking of the importance of rehabilitation of the disabled, of mental hygiene, and of the growing significance of the degenerative diseases as a public health problem.

As time went on, these papers show, Dr. Mountin continued to urge on all public health workers an appreciation of the changes being brought about in the needs they must serve, because of the reduction in the communicable disease problem, the increase in the number of older people in the population, the impossibility of preventing, in the present state of our knowledge, the great causes of death and disability today: cardiovascular disease, malignancy, diabetes, arthritis, mental illness, etc. He points out repeatedly that these are now public health problems and that they require new and different case-finding technics and, especially, that their control, at least for the present, depends upon early diagnosis and treatment. Hence, he indicated that health departments, if they wish to continue to render a useful public service, would not only have to change their methods of finding cases, but might well be obliged to engage in medical care of individuals to an extent undreamed of in the traditional official health agency in this country and, indeed, to an extent repugnant to many health officers.

Although many of the papers in the selection are statements of broad policy, or even philosophy, they are never high-flown or unrealistic. In fact, one can say that Dr. Mountin emerges from them as just the kind of person he was—energetic, hard-headed, realistic, but restless and filled with what can hardly be better termed than "divine discontent."

If any general ideas can be said to be common to all these writings, they are perhaps these:

That the relatively good public control now exercised over the major, killing communicable diseases has reduced the difference between preventive and curative medicine to the vanishing point. This control has, in fact, emphasized the essential unity of all health work, whether "public health," medical

practice, hospitalization, or what not. Public health agencies must recognize this fact and prepare themselves for new types of service—for chronic disease, rehabilitation, mental illness, medical care, environmental protection against air pollution and radiation, and research. These new services, demanded by the public, will inevitably be provided by new agencies if the existing public health agencies are not ready to take them on (and he enumerates example after example of where exactly this has occurred).

In addition, he felt that effective and economical organization in public health is dependent not only upon well trained workers in the various professional categories, but upon sound financing, good administrative planning, smooth working relationships within the agency and, at least equally important in Dr. Mountin's mind, between the official health agency and other agencies, voluntary and official, in the health and welfare fields. He also believed that professional and technical personnel should not be wasted performing functions that can be performed as well (or better) by less highly trained people, and that public health department activities, whether financed entirely locally or aided with state and federal funds, must be responsive primarily to local needs and help solve local problems.

Finally, he suggested, particularly in the later papers, that active participation of the general lay public in public health policy-making and program-planning is of crucial importance to the official health agency, to the governmental unit concerned, and to the community itself.

All this and much more is covered in this remarkable man's broad-visioned, highly imaginative writing, as shown here. The selection might have benefited, some will feel, by the inclusion of a few more of Dr. Mountin's excellent technical papers—some of the surveys of the activities of state health agencies in the 1941–1943 series, for instance, or some of the hospital studies of the 1936–1942 group. But, on the whole, the selection is representative of Dr. Mountin's best work and is decidedly worth the careful attention of every health worker, especially every one who may feel a bit puzzled or lost in the rapidly changing health scene. Dr. Mountin, to an astonishing degree, sees all these things in perspective and shows us the principles upon which we must base our future thought and action.

DEAN A. CLARK

The First Twenty-Five Years. The Story of a Foundation—W. K. Kellogg Foundation. Battle Creek, Mich. The Foundation, 1956. 256 pp.

This book tells the story of the remarkable contributions of the Kellogg Foundation to progress in health, education, and agriculture, during the last quarter century. It describes how more than $50,000,000 was disbursed between 1930 and 1955 to aid projects designed to help solve problems in these fields. An additional section contains the annual report of the foundation for the year 1954–1955.

One chapter is devoted to a brief description of the cultural and economic changes that have occurred in America during the last quarter century and their impact on health, education, and agriculture.

Other chapters deal with the major projects and project areas to which the foundation has given assistance. They tell about the initial interests of the foundation in the Michigan Community Health Project and later interests in state and national problems and in those of other countries as well.

Short accounts are given of foundation-sponsored projects in public health, health education in the schools, home

maternity and infant care, home accident prevention, nutrition, and diagnostic services, among others, and of the efforts of the foundation to improve undergraduate and postgraduate education of the medical and allied professions and of public health workers and hospital administrators.

The activities of the foundation in general education and agriculture are also recounted. A few of the major projects in these areas are those in rural school consolidation, education of the exceptional child, and a cooperative program in educational administration, as well as an experimental agricultural extension project, programs of education for farm youth, and a national project for improving communications with the farmer.

A final chapter briefly assesses the foundation's past accomplishments and attempts to point up those areas in which the foundation may make future contributions. EDWARD M. COHART

Food Poisoning—By G. M. Dack (3rd ed.). Chicago, Ill.: University of Chicago Press (5750 Ellis Ave.), 1956. 251 pp. Price, $6.00.

This book, which has been widely accepted as the most authoritative in its field, has been thoroughly revised and enlarged to include results from recent research investigations.

Food poisoning may result from a diverse group of inciting agents, including chemicals, poisonous plants and animals, and bacteria and their products. In addition, food cannot be excluded as a vehicle of infection in epidemics of acute digestive disorders of viral or unknown etiology.

The author discusses methods of investigation and stresses critical analysis of the symptomatology, epidemiology, and pathology of each type of gastrointestinal upset which may be due to food poisoning. Outbreaks, case histories, and laboratory studies and research from all parts of the world are cited with references to original reports and literature.

Laboratory investigations appropriate to each type of outbreak are outlined, but for detailed technics of chemical, bacteriological, and viral methods the reader is frequently referred to textbooks in the specialized fields.

To the investigator of food poisoning incidents, this book will prove to be invaluable, not only as a guide to correct diagnosis but also as a deterrent to reaching false conclusions.

EDMUND K. KLINE

Adolescent Development and Adjustment—By Lester D. Crow and Alice Crow. New York: McGraw-Hill (330 West 42nd St.), 1956. 555 pp. Price, $5.50.

These authors review many of the matters which are of importance to adults who work with adolescents. Factors in the physical and psychological growth of young people are discussed, and the origin, nature, and management of many of their behavior problems are outlined. For the more serious student there is material relating both to the cultural bases of adolescent behavior and to the characteristics and limitations of various methods which have been used in the study of this age group.

Throughout the authors give evidence of their wide experience by their careful selection of material and by their discriminating choice of references. If used as a basic text and outline, and liberally supplemented with further reading in those fields (particularly sexual adjustment, minor emotional disorders and the factors in scholastic failure) which cannot be extensively covered in a book of this scope, this volume can be of considerable aid in widening a health worker's or a teacher's understanding of the adolescent. J. ROSWELL GALLAGHER

Clinical Laboratory Diagnosis—By Samuel A. Levinson and Robert P. MacFate (5th ed.). Philadelphia: Lea and Febiger (600 Washington Square), 1956. 1246 pp. Price, $12.50.

The scope of this volume far exceeds that of a laboratory manual, for it relates laboratory procedures and findings to the clinical symptomatology and pathology of disease as well as to expected normal values. It includes many desirable reviews of anatomy, physiology, and biochemistry as related to laboratory findings and as a means of orientation.

The methods presented have been selected as those which have been of proved value to the authors and their colleagues, including newer methods based on recent research in experimental medicine and clinical pathology. The entire range of laboratory service is covered, including such specialties as parasitology, tropical diseases, mycology, legal medicine and toxicology, skin tests, and laboratory problems in pediatrics.

The present edition has been extensively revised with several of the chapters completely rewritten. Terminology in the section on blood typing and blood banks is that recommended by the National Institutes of Health and, as in the preceding edition, hematology is discussed in the terms of the Committee on Hematology of the American Society of Clinical Pathologists.

A valuable feature of the book is the presentation of a vast amount of material in tabular form, 142 tables being included, of which 74 are labeled as being of special interest to physicians, including a table of 14 pages listing important laboratory procedures to be considered in the common diseases.

Practicing physicians, interns, medical students, medical technologists, in fact all workers concerned with laboratory findings in the diagnosis and treatment of disease, will find this book a reliable guide both for everyday use and as a reference source.

EDMUND K. KLINE

Modern Public Health for Medical Students—By I. G. Davies. Baltimore, Md.: Williams and Wilkins (Mt. Royal and Guilford Avenues), 1955. 487 pp. Price, $6.75.

This is a British textbook written by the professor of public health and preventive medicine of the University of Leeds.

Since the author looks at public health, or national health, from the broad perspective of the "unity of ill-health and disease with other forms of social sickness," this volume is an impressive documentary of the integration of preventive and curative, medical, and social measures adopted in Great Britain.

The sequence of the chapters, different from traditional texts, reflects the author's basic philosophy: after setting the stage by discussing heredity, nutrition and the measurement of health, the author proceeds to a very detailed description of "the organization of medico-social care," with particular emphasis on the ramifications of the National Health Service and National Insurance Acts.

The reasons given for going into such great detail in a text for medical students are twofold: the state is putting increasing demands on practitioners for guidance in solving community health and welfare problems, and the everyday practice is carried out within the complex framework of the services provided by the legislation.

The text continues with chapters on diseases of special social importance, mental and occupational health, rehabilitation and resettlement, and handicapped persons. The sections dealing with maternal, infant, child, and school health emphasize health problems as part of the total life situation of these

special groups, one whole page, for instance, being devoted to the unmarried mother.

The chapter on communicable diseases, consisting of a good general discussion, although spotty coverage of specific diseases, contains the remarkable sentence, "It is important to remember that in addition to being a disabling disease pulmonary tuberculosis is also a communicable disease," which characterizes the spirit of this book so well.

Environmental sanitation is purposely omitted because "it is not the concern of the medical practitioner as such." However, a separate chapter is devoted to home accidents. The text concludes with discussions of international health and health education, considered in a very intriguing fashion from the historical perspective.

While this volume is probably more suitable as a text for British than for American students, it is highly recommended to all teachers of preventive medicine, as well as to other health and welfare workers who are raising the question where public health might be going. GERTRUD WEISS

The States and Their Older Citizens—A Summary of the Problem and a Program of Action. A Report to the Governor's Conference by the Council of State Governments. Chicago, Ill.: The Council (1313 E. 16th St.), 1955. 194 pp. Price, paperbacked, $3.00.

This is a straightforward and somewhat simplified statement concerning one of America's most complex problems. It constitutes an excellent introduction for legislators and citizen groups, offering both a summary of the size and content of the problem and a statement of objectives for older people, with an action program designed to achieve those objectives. The program is supported by briefly stated examples from activities in the several states.

A great deal of material is covered through the use of simple, unqualified expository statements and an almost staccato form. The description of the many facets of the problem of the aging is supplemented through the use of 16 fairly effective charts and maps in the text and 50 tables in an appendix. The latter come primarily from government sources and reference to these sources will frequently be required for precise definition of the terms used. A selected bibliography, including a most useful list of state reports on aging and chronic illness, concludes the report.

Health workers will note with satisfaction an emphasis on prevention and rehabilitation. However, despite the breadth of coverage, every field concerned with the aging will probably find a few important omissions, some material in the specific field uncritically used, and a few unimportant inclusions. For example, the fundamental work of the APHA Committee on the Hygiene of Housing, reported in "Housing an Aging Population," is completely neglected. "The Problem of Physical Health" is stated in three and one-half pages; "The Problem of Mental Health" in about eight pages.

The professional worker will find this a useful statement of the general picture and an introduction to the areas of knowledge and action of other professionals. He will find it necessary to verify and extend the discussion in his specific professional field. If widely read for what it is—an elementary handbook on the problems of the aging, and suggested solutions—this report will serve the professional worker well by preparing the community, its legislators, and administrators for constructive action. JONAS N. MULLER

Books Received

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ACCIDENTAL POISONING IN CHILDHOOD. Prepared by the Committee on Accident Prevention, American Academy of Pediatrics. Edward Press. Springfield, Ill.: Thomas, 1956. 131 pp. Price, $3.00.

ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS 1953 (STATISTIQUES EPIDEMIOLOGIQUES ET DEMOGRAPHIQUES ANNUELLES) French and English edition. WHO, Geneva, 1956. New York: Columbia University Press, 1956. 571 pp. Price, $10.00.

BOLIGFORHOLD OG BØRNESYGELIGHED (Relationship Between Housing and Morbidity). Vagn Christensen. Copenhagen, Denmark: Ejnar Munksgaard, 1956. 211 pp. Price, Dan. kr. 16.50.

DENTAL HEALTH. Edited by H. H. Stones. London: Dental Board of the United Kingdom, 1956. 83 pp., 62 illus. Price, 10s. 6d. post free.

EDUCATORS GUIDE TO FREE SLIDEFILMS. Compiled and Edited by Mary Foley Horkheimer and John W. Diffor (8th ed.). Randolph, Wis.: Educators Progress Service, 1956. 188 pp. Price, $5.00.

ELEMENTARY TEACHERS GUIDE TO FREE CURRICULUM MATERIALS. Edited by Patricia Horkheimer Suttles. Randolph, Wis.: Educators Progress Service, 1956. 318 pp. Price, $5.50.

FAMILY MEDICAL COSTS AND VOLUNTARY HEALTH INSURANCE: A NATIONWIDE SURVEY. Odin W. Anderson with Jacob J. Feldman. New York: McGraw-Hill, Blakiston Division, 1956. 251 pp. Price, $6.50.

HISTORY OF THE SCHOOL OF TROPICAL MEDICINE IN LONDON 1899–1949. Sir Philip Manson-Bahr. London School of Hygiene and Tropical Medicine Memoir No. 11. London: Lewis, 1956. 328 pp. Price, £2. 10s. 0d. net.

MANUAL OF PARASITIC MITES. E. W. Baker, et al. New York: National Pest Control Association, 1956. 170 pp. Price, $4.25.

MENTAL DISORDERS IN LATER LIFE. Edited by Oscar J. Kaplan (2nd ed.). Stanford, Calif.: Stanford University Press, 1956. 508 pp. Price, $7.50.

MYOCARDIAL INFRACTION. AN EPIDEMIOLOGIC AND PROGNOSTIC STUDY OF PATIENTS FROM FIVE DEPARTMENTS OF INTERNAL MEDICINE IN OSLO 1935–1949. Oslo, Norway: Ulleval Sykehus, Life Insurance Companies' Institute for Medical Statistics at the Oslo City Hospitals, 1956. 58 pp.

NURSE-PATIENT RELATIONSHIPS IN A HOSPITAL MATERNITY SERVICE. Marion S. Lesser and Vera R. Keane. St. Louis, Mo.: Mosby, 1956. 301 pp. Price, $4.25.

OBSERVATIONS ON KREBIOZEN IN THE MANAGEMENT OF CANCER. A. C. Ivy, et al. Chicago, Ill.: Reginery, 1956. 102 pp. Price, $2.50.

OCCUPATIONAL HEALTH NURSING. Mary Louise Brown and John Wister Meigs. New York: Springer, 1956. 276 pp. Price, $4.50.

PHYSICAL MEASURES IN THE TREATMENT OF POLIOMYELITIS. R. J. S. Reynolds. New York: Macmillan, 1956. 140 pp. Price, $2.50.

PROCEEDINGS, FIRST INTERNATIONAL CONFERENCE ON THE USE OF ANTIBIOTICS IN AGRICULTURE. The Agricultural Board and the Agricultural Research Institute National Academy of Sciences—National Research Council, October 19–21, 1955. Washington, D. C.: The Academy and the Council, 1956. 278 pp. Price, $2.50.

PSYCHIATRIC RESEARCH REPORTS No. 5. RESEARCH TECHNIQUES IN SCHIZOPHRENIA. Edited by Members of the Committee on Research 1955–1956. Washington, D. C.: American Psychiatric Association, 1956. 153 pp. Price, $2.00.

RURAL WATER SUPPLY AND SANITATION. Forrest B. Wright (2nd ed.). New York: Wiley, 1956. 347 pp. Price, $4.96.

SELECTED REFERENCE ON CARDIOVASCULAR DISEASES. AN ANNOTATED BIBLIOGRAPHY FOR NURSES. Washington, D. C.: Gov. Ptg. Office, 1956. 52 pp. Price, $.25.

SLEEP. THE WAY TO SOUND AND HEALTHFUL SLUMBER. Marie Stopes. New York: Philosophical Library, 1956. 154 pp. Price, $3.00.

TODAY'S INDUSTRIAL NURSE AND HER JOB. Erna Barschak. New York: Putnam's, 1956. 112 pp. Price, $3.20.

TRAINING OF SANITARY ENGINEERS, THE: SCHOOLS AND PROGRAMMES IN EUROPE AND IN THE UNITED STATES. Milivoj Petrik. WHO Monograph Series No. 32. New York: Columbia University Press, 1956. 151 pp. Price, $4.00.

TRUTH ABOUT EYE EXERCISES, THE. Philip Pollack. Philadelphia, Pa.: Chilton, 1956. Price, $4.75.

VITAL STATISTICS OF THE UNITED STATES 1954. VOL. II, MORTALITY DATA. Prepared under the supervision of Halbert L. Dunn, U. S. Department of Health, Education, and Welfare. Washington, D. C.: Gov. Ptg. Office, 1956. 505 pp. Price, $4.00.

Medical Research Fellowships Administered by National Academy of Sciences

The Division of Medical Sciences of the National Academy of Sciences is accepting, until December 1, 1957, applications for postdoctoral research fellowships for 1957–1958. The fellowships are designed to offer research experience in the basic medical sciences for those planning careers in academic medicine and investigation. Applicants must be citizens of the United States or Canada with a doctorate or its equivalent, and ordinarily 35 years of age or younger. The three groups of awards are the National Research Fellowships in the Medical Sciences supported by the Rockefeller Foundation, the Donner Fellowships for Medical Research from a Donner Foundation grant, and the Markle Fellowships in the Medical Sciences from a new appropriation by the John and Mary R. Markle Foundation.

In addition, the division's Committee on Radiology administers the James Picker Foundation's Fellowships in Radiological Health designed for candidates wishing to develop skills leading to investigative careers in radiology. There are no citizenship limitations, otherwise requirements follow those mentioned above.

Further details and application blanks from Division of Medical Sciences, Room 310, 2101 Constitution Ave., N.W., Washington 25, D. C.

A Selected Public Health Bibliography with Annotations

Shadow of Coming Event—A small increase in gross mortality rates is presaged for the current year. The rise reflects increases mainly in mortality from major chronic conditions, notably the cardiovascular-renal diseases. This is just a reminder that death rates cannot be expected to keep on going down indefinitely.

ANON. Moderate Increase in Mortality This Year. Statist. Bull. Metrop. Life Insur. Co. 37, 7:6 (July), 1956.

Eloquence—You will like the way this distinguished (British) physician puts forth his views on the state of current public health practice in England. The over-all picture is familiar to most of us, I suppose. But his "Centenary Oration" is replete with adaptable comments that would seem to be pithy enough to survive a sea voyage.

ADRIAN, EDGAR DOUGLAS, First Baron. Organizers of Health. Pub. Health 69, 10:254 (July), 1956.

Ten-Billion-Dollar Industry—Reported in sufficient detail are the findings of a national survey of family medical expenditures and voluntary medical insurance contributions to show the distribution of costs among families. The extent of insurance coverage is estimated along with its effectiveness in spreading costs. Ways to encourage growth of this sort of insurance are explored. You will want to review and file away these findings.

ANDERSON, O. W. The Effectiveness of Voluntary Health Insurance. Hospitals 30, 13:24 (July 1), 1956.

More About APC Vaccines—A progress report on the value of trivalent vaccines against these viruses (reported provisionally in the September issue of the A.J.P.H.). Substantial reductions —in the order of half to three-quarters of the expected incidences—were recorded in this demonstration.

BELL, J. A., et al. Efficacy of Trivalent Adenovirus (APC) Vaccine in Naval Recruits. J.A.M.A. 161, 16:1521 (Aug. 18), 1956.

Wonders-Will-Never-Cease Department—"Shell-less eggs will soon appear on the market . . . the eggs may be poached or boiled and served in the container in which they are packed."

GULLICKSON, C. D. Imaginators at Work. J. Am. Dietet. A. 32, 71:657 (July), 1956.

Effective Propaganda—In the August issue of McCall's Magazine there appears a persuasive argument for the fluoridation of public water supplies. The Committee to Protect Our Children's Teeth, Inc., thinks this will be of unusual interest to you and may be influential with the people you come in contact with.

HEILBRONER, R. L. The Fluoridation Scare. McCall's Magazine 83, 11:62 (Aug.), 1956.

Lest We Forget—As late as 40 years ago midwives were still delivering about 40 per cent of all American babies. During the two decades following that date the midwives sketchy services dropped off to about 10 per cent. Now they are reaching the vanishing point. Home deliveries attended by physicians, too, were in the majority as late as twenty years ago; now almost all (white) births occur in hospitals.

JACOBSON, P. H. Hospital Care and the Vanishng Midwife. Milbank Mem. Fund Quart. 34, 3:253 (July), 1956.

Cysts vs. Chlorine—You will find an antidote for complacency in this story of an epidemiologic study of water-borne outbreak of amebiasis—one of the only three reported in the (United States) literature so far. Half the personnel of an industrial plant gave evidence of infestation at one time or another, but only 31 clinically recognizable cases were unearthed. The factory water supply had been chlorinated, but the cysts had not been destroyed.

LeMaistre, C. A., et al. Studies of a Water-Borne Outbreak of Amebiasis, South Bend, Indiana. Am. J. Hyg. 64, 1:30 (July), 1956.

Old Dogs' Tricks—This will come as reassuring news to some of us. It used to be asserted that intelligence grows throughout youth reaching a top at 21. Then it was thought to decline slowly until, at age 55, the recession had returned to the 14-year level. Not so, says this research. Intelligence tests, as measured by ability to learn, suggest that both intellect and performance in using it are both maintained without decrement throughout middle maturity. "Middle maturity" is, of course, your present age!

Lorge, I. Aging and Intelligence. J. Chronic Dis. 4, 2:131 (Aug.), 1956.

Screening Tests—Of 7,000 Baltimorians (over 17) invited to enjoy a battery of tests designed to detect certain chronic conditions, 2,000 plus responded and a little more than half were found to have one or more of the searched for abnormalities. The results indicate "that multiple screening is a procedure of promise." A lot needs still to be done to make it better, however.

Roberts, C. M., and Wylie, C. B. Multiple Screening in the Baltimore Study of Chronic Illness. J.A.M.A. 161, 15:1442 (Aug. 11), 1956.

Do-It-Yourself Sanitation—A Promising trend toward self-inspection by various local industries, the outcome of a planned program of consultation and education through jointly sponsored seminars, is reported by the Phoenix (Ariz.) Public Health Department.

Rosen, M.P., and Craig, D. L. Industry-Health Department Teamwork. Modern San. 8, 7:20 (July), 1956.

Educating Parents—Do parents profit from group discussion? We assume they do, because they seem interested and sometimes express appreciation of benefits derived. But objective measures of improved behavior are seldom made because of (1) difficulties with measuring instruments, (2) controls, and (3) the nature of the discussion methods employed. Reported here are some findings of a research aimed to surmont some of these diffculties.

Shapiro, I. S. Is Group Parent Education Worth While? Marriage & Family Living. 18, 2:156 (May), 1956.

Prospect Promising—What's next in the prevention and care of poliomyelitis? You will not want to miss this panel examination of the still wide open subject when you learn that the panelists were Drs. Van Riper, Horstman, Rhodes, Culbertson, and Rivers.

Stimson, P. M., et al. New Horizons in Poliomyelitis. New York Med. 12, 14:626 (July 20), 1956.

"Safe, Potent, Effective"—There is good theoretic evidence, if not yet final proof, that immunity provided by the Salk vaccine will be of long duration and that the widespread use of the vaccine will achieve a kind of herd immunity against paralytic poliomyelitis, protecting some of the population who are not vaccinated. This is only

one of the many significant conclusions reached by the author.

VAN RIPER, H. E. The Present Status of the Salk Vaccine for the Control of Paralytic Poliomyelitis. New York State J. Med. 56, 14:2229 (July 15), 1956.

Centenary—Historians will welcome this account of the first hundred years of the (British) Society of Medical Officers of Health. Though it is a year-by-year story of what the society did, it is also and inevitably a history of public health in Great Britain.

WALTON, W. S. The History of the Society of Medical Officers of Health 1856–1956. Pub. Health 69, 8:160 (May), 1956.

Something for Nearly Everybody—Six papers read at a recent symposium on Progress in Preventive Medicine are not to be missed if your interests include "informing the public." They cover—the statistical basis for evidences of progress, industrial and agricultural preventive medicine, problems of chronic disease, modern antituberculosis therapy, and international policies. Though all the addresses are slanted toward the practicing physician they have much to say to other audiences.

WATT, J., et al. Progress in Preventive Medicine (and five related papers). J.A.M.A. 161, 14:1357 (Aug. 4), 1956.

That Old Swimming Hole—Two dozen (Georgia) frequenters of a swimming hole in a "branch," in which dogs, cattle, and pigs occasionally disported themselves first, came down with canicola fever. The occurrence of a grippe-like fever coupled with a history of swimming in probably contaminated water should suggest leptospirosis, say the authors.

WILLIAMS, H. R., et al. An Epidemic of Canicola Fever in Man with the Demonstration of Leptospira canicola Infection in Dogs, Swine and Cattle. Am. J. Hyg. 64, 1:46 (July), 1956.

If additional information is desired regarding the articles listed in this Bibliography, please communicate directly with the publication in which they appeared; the addresses are furnished for your convenience.

Am. J. Hyg. (American Journal of Hygiene), 615 N. Wolfe St., Baltimore 5, Md.

J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.

J. Am. Dietet. A. (Journal of the American Dietetic Association), 620 N. Michigan Ave., Chicago, Ill.

J. Chronic Dis. (Journal of Chronic Diseases), C. V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Mo.

Hospitals (American Hospital Association), 18 East Division St., Chicago 10, Ill.

McCalls Magazine, 230 Park Avenue, New York, N. Y.

Marriage & Family Living (National Council on Family Relations), 450 Ahnaip St., Menasha, Wis.

Milbank Mem. Fund Quart. (The Milbank Memorial Fund Quarterly), 40 Wall St., New York, N. Y.

Modern San. (Modern Sanitation), 855 Avenue of the Americas, New York 1, N. Y.

New York Med. (New York Medicine) Medical Society of the County of New York. 2 East 103rd St., New York 29, N. Y.

New York State J. Med. (New York State Journal of Medicine), 292 Madison Ave., New York 17, N. Y.

Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C.1, England.

Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

Association News

EIGHTY-FOURTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
ATLANTIC CITY, N. J., NOVEMBER 12–16, 1956

APPLICANTS FOR FELLOWSHIP

The names of applicants for Fellowship are published herewith. They have requested affiliation with the Sections indicated. Official action by the various Section Councils, the Executive Board (acting on unaffiliated applications), the Committee on Eligibility, and the Governing Council will take place during the Annual Meeting in Atlantic City, N. J., November 12–16, 1956.

Health Officers Section

Raphael Martin Adelman, D.D.S., M.D., Health Commissioner, Island Lake, Ill.

Erwin Howard Braff, M.D., M.P.H., Chief, Div. of Venereal Disease Control, City and County of San Francisco Dept. of Public Health, San Francisco, Calif.

Bernard Bucove, M.D., D.P.H., Director, State Dept. of Health, Olympia, Wash.

Charles Metz Cameron, Jr., M.D., M.P.H., Assoc. Professor, Public Health Administration, Univ. of North Carolina School of Public Health, Chapel Hill, N. C.

Charles Burdis Davis, M.D., M.P.H., Health Officer, Consolidated Board of Health, Wilmington, N. C.

Newman Houghton Dyer, M.D., M.P.H., State Director of Health, State Dept. of Health, Charleston, W. Va.

John Gardner, M.D., Asst. Health Officer, Dept. of Public Health, Long Beach, Calif.

Robert Henry Hamlin, M.D., M.P.H., LL.B., Director of Public Health, Health Dept., Brookline, Mass.

Matthew James Hantover, M.D., M.P.H., Officer (Capt.) in Charge, Naval Medical Research Unit No. 4, Great Lakes, Ill.

Henry Montfort Hardwicke, M.D., Medical Consultant, Div. of Health, Jefferson City, Mo.

William Sinclair Harper, M.D., C.M., D.P.H., Health Officer, Eastern Health District, Health Dept., Baltimore, Md.

Jose Angel Hernandez-Matos, M.D., M.P.H., Physician V, Dept. of Health, San Juan, Puerto Rico

Joseph P. Kesler, M.D., Acting Director of Public Health, State Health Dept., Salt Lake City, Utah

Carl C. Kuehn, M.D., M.P.H., Director of Local Health, State Dept. of Health, Camp Hill, Pa.

Charles Alfred Pigford, M.D., M.P.H., Director, City-County Health Unit, Lubbock, Tex.

James J. Powers, M.D., Health Officer, Health Dept., Manchester, N. H.

Gregory George Shields, M.D., M.P.H., District Health Officer, State Board of Health, Wisconsin Rapids, Wis.

Norman R. Sloan, M.D., Assistant Chief, Bureaus of Geriatrics, Cancer and Venereal Disease, Board of Health, Honolulu, Hawaii

James Finley Speers, M.D., M.P.H., Health Officer, Brevard-Osceola County Unit, Cocoa, Fla.

Leon Jair Taubenhaus, M.D., M.P.H., Asst. Director, Health Dept., Brookline, Mass.

Russell E. Teague, M.D., M.P.H., Commissioner, State Dept. of Health, Louisville, Ky.

Franklin Duane Yoder, M.D., M.P.H., Director, State Dept. of Health, Cheyenne, Wyo.

Laboratory Section

Alcor S. Browne, Ph.D., Chief, Bacteriology Laboratory, State Dept. of Health, Berkeley, Calif.

Thomas Patrician Hughes, Ph.D., M.P.H., Public Health Laboratory Consultant, World Health Organization, Panama, Republic of Panama

Theckla Jean Johnston, M.A., Asst. Bacteri-

ologist in Charge of Venereal Disease Laboratory, Dept. of Public Health, Oakland, Calif.

Edward Kravitz, D.Sc., Supervisory Research Bacteriologist, Industrial Test Laboratory, Naval Shipyard, Philadelphia, Pa.

Irving Olitsky, Ph.D., Principal Bacteriologist and Asst. Chief, Public Health Laboratory, Dept. of Health, Philadelphia, Pa.

John Frederick Reback, Sc.D., Microbiologist, Sinai Hospital Laboratories, Baltimore, Md.

Marjorie L. Sutherland, Ph.D., Consulting Statistician, Indianapolis, Ind.

Statistics Section

William Donald Carroll, B.B.A., C.P.H., State Registrar and Director, Division of Vital Statistics, State Dept. of Health, Austin, Tex.

William Gemmell Cochran, M.A., Professor of Biostatistics, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

John Herbert Doughty, M.A., Director of Vital Statistics, Dept. of Health and Welfare, Province of British Columbia, Victoria, B. C., Canada

Myron K. Gordon, Ph.D., Chief, East European Section, Medical Information and Intelligence Division, Office of the Surgeon General, Washington, D. C.

Edward Cuyler Hammond, Sc.D., Director, Statistical Research Section, American Cancer Society, New York, N. Y.

Fraser Harris, Director, Health and Welfare Division, Dominion Bureau of Statistics, Ottawa, Ont., Canada

Eleanor P. Hunt, Ph.D., Asst. Chief, Program Analysis Branch, Div. of Research, Children's Bureau, Washington, D. C.

Ben Zion Locke, M.S., Chief, Consultation Unit, Biometrics Branch, National Institute of Mental Health, Bethesda, Md.

Margaret Pearl Martin, Ph.D., Assoc. Professor of Biostatistics, Dept. of Preventive Medicine and Public Health, Vanderbilt Medical School, Nashville, Tenn.

Margaret Elizabeth Rice, M.Sc., Supervisor, Statistical Service, State Board of Health, Jackson, Miss.

Grace C. Scholz, B.A., Statistician, Div. of Dental Public Health, U. S. Public Health Service, Washington, D. C.

William Henry Veigel, Chief, Div. of Vital Statistics Section, Public Health Council, State Dept. of Health, Columbus, Ohio

Engineering and Sanitation Section

Abraham E. Abrahamson, Ph.G., Chief, Wholesale Div., Dept. of Health, New York, N. Y.

William Thomas Ballard, M.S., District Engineer, State Dept. of Health, Austin, Tex.

Frank A. Butrico, M.S., Asst. Chief, Office of Engineering Resources, U. S. Public Health Service, Washington, D. C.

Charles Garfield Decker, M.S., Professor, Dept. of Civil Engineering, Texas Technological College, Lubbock, Tex.

Raymond Everett Dole, Sr. Sanitarian, Los Angeles County Health Dept., Los Angeles, Calif.

Pastor S. Echavez, C.E., M.P.H., Public Health Engineer, Taiwan Provincial Malaria Research Institute, World Health Organization, Ch'ao-Chow, Taiwan

Albert Lee Fishback, M.P.H., District Sanitary Engineer, State Dept. of Health, Cuyahoga Falls, Ohio

Irving Grossman, M.S.E., District Sanitary Engineer, State Dept. of Health, Syracuse, N. Y.

Anthony J. Kranaskas, C.E., Assoc. Chief of Party and Chief Engineer, Health and Sanitation Div., Institute of Inter-American Affairs, Colombia, South America

J. Don Layson, M.P.H., Director of Sanitation, San Joaquin Local Health District, Stockton, Calif.

Paul Levin, M.P.H., Public Health Engineer, DuPage County Health Dept., Wheaton, Ill.

Walter Alphons Lyon, M.S.S.E., Asst. Chief, Environmental Health Section, Dept. of Health, Philadelphia, Pa.

Daniel Francis McCarthy, B.S., Sanitarian in Charge, Public Health Dept., General Electric Co., Richland, Wash.

Charles Gray King Memory, B.S.Eng., Director of Environmental Sanitation, Columbia-Richmond Health District, Augusta, Ga.

Rafael Miranda-Franco, M.S.S., Public Health Engineer, Pan American Sanitary Bureau, World Health Organization, Mexico City, D.F., Mexico

Henry Clifford Mitchell, C.E., Director, Div. of Sanitation, St. Louis County Health Dept., Clayton, Mo.

Romeo Mondello, M.S.S.E., LL.B., Superintendent Engineer, Div. of Inspections, Dept. of City Planning, Montreal, Que., Canada

Francis William Montanari, M.C.E., Sanitary Engineer Consultant, Institute of Inter-American Affairs, Balboa, Canal Zone

Robert E. Mytinger, M.P.H., Asst. to Secretary, Public Health Committee, Paper Cup and Container Institute, New York, N. Y.

Dixon Raines Olive, Jr., M.S.S.E., Director of Sanitation Div., Muscogee, Harris, Chattahoochee Health District, Columbus, Ga.

Joseph W. Price, M.S.E., Director of Sanita-

tion and Public Health Engineer, Washtenaw County Health Dept., Ann Arbor, Mich.

Perry Raymond Summerlin, B.S., Deputy Health Officer, Ottumwa, Iowa

A. Dale Swisher, B.S., Sanitary Engineer, International Cooperation Administration, Mutual Security Mission to China, APO San Francisco, Calif.

Edward Rudolph Taddeo, M.S.P.H., Sanitarian, Health Dept., Natick, Mass.

Hunter George Taft, Jr., B.S., Sanitary Engineer, Headquarters, Ryukyus Command, U. S. Army, APO San Francisco, Calif.

Ellis Alvord Tarlton, M.S.S.E., Sanitary Engineer, City of Danbury, Conn., and Consultant Sanitary Engineer, Danbury, Conn.

Arthur Wallach, M.S.S.E., Chief, Environmental Health Section, Dept. of Public Health, Philadelphia, Pa.

Norman Mackenzie Winch, B.C.E., Public Health Engineer, Health Dept., Portland, Me.

Occupational Health Section

Ernest Mastromatteo, M.D., D.P.H., Industrial Physician, Div. of Industrial Hygiene, Ontario Dept. of Health, Toronto, Ont., Canada

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Food and Nutrition Section

Anne Bourquin, Ph.D., Professor of Nutrition, Dept. Chairman, College of Home Economics, Syracuse Univ., Syracuse, N. Y.

Margaret Angeline Dunham, M.S., Director, Div. of Nutrition, State Board of Health, Indianapolis, Ind.

Mary Caroline Egan, M.P.H., Senior Public Health Nutritionist, State Dept. of Health, Albany, N. Y.

David Mark Hegsted, Ph.D., Assoc. Professor of Nutrition, Harvard Univ. School of Public Health, Boston, Mass.

Edith A. Jones, M.S., Chief, Nutrition Dept., Clinical Center, National Institutes of Health, Bethesda, Md.

Eleanor Louise McKnight, M.S., Chief, Div. of Nutrition, Health Dept., Baltimore, Md.

Orrea Florence Pye, Ph.D., Assoc. Professor of Nutrition, Teachers College, Columbia Univ., New York, N. Y.

Elsie Wells Russell, M.P.H., Director, Nutrition Div., Health Dept., Los Angeles, Calif.

William Donald Simmons, M.P.H., Supervisor, Prevention of Blindness Project, State Dept. of Public Health, Berkeley, Calif.

Albert A. Taylor, D.V.M., M.P.H., Project Scientist, Aero Medical Laboratory, Wright Air Development Center, Dayton, Ohio

Lester Joseph Teply, Ph.D., Director, Projects and Public Relations, Wisconsin Alumni Research Foundation, Madison, Wis.

Mabel Todd, M.S., Nutrition Service Supervisor, State Dept. of Health, Richmond, Va.

Ruth E. Tucker, Ph.D., Professor and Research Professor of Food and Nutrition and Head of Dept., Univ. of Rhode Island, Kingston, R. I.

Izola F. Williams, M.S., Chief, Nutrition Service, State Dept. of Health, Columbus, Ohio

Mayton O. Zickefoose, M.S., Nutrition Consultant, State Board of Health, Dover, Del.

Maternal and Child Health Section

Leslie Corsa, Jr., M.D., M.P.H., Chief, Bureau of Maternal and Child Health, State Dept. of Public Health, Berkeley, Calif.

Samuel Weith Dooley, M.D., Asst. Attending Pediatrician, New York Hospital, and Asst. Professor of Clinical Pediatrics, Cornell Univ. Medical College, New York, N. Y.

Frank Ephraim Engelman, M.D., Clinical Physician, City Health Dept., and Asst. Instructor, Pediatrics Dept., Univ. of Pittsburgh Medical School, Pittsburgh, Pa.

Dolph Vernon Galloway, M.D., M.P.H., Director, Maternal and Child Health, State Board of Health, Jackson, Miss.

Virginia Insley, M.S.W., Chief, Medical Social Work Section, Children's Bureau, Washington, D. C.

Isabel E. Mahoney, R.N., M.A., Consultant Public Health Nurse in Child Health, Dept. of Health, New York, N. Y.

George Donald Carlyle Thompson, M.D., M.P.H., Executive Officer, State Board of Health, Helena, Mont.

John Whitridge, Jr., M.D., Chief, Bureau of Preventive Medicine, State Dept. of Health, Baltimore, Md.

Public Health Education Section

William Austin Allen, M.P.H., Director, Health Education, Dept. of Health, Philadelphia, Pa.

Robert H. Conn, M.P.H., Chief, Community Health Section, State Dept. of Health, Harrisburg, Pa.

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Myrton L. McDonald, M.A., Administrative Services Officer, Health Dept., Dallas, Tex.

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Public Health Nursing Section

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School Health Section

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Dental Health Section

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Harold Hillenbrand, D.D.S., B.S.D., Secretary, American Dental Assn., Chicago, Ill.

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Medical Care Section

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Stephen Salmon Henkin, B.S., Consultant on Medical Records, Div. of Group Practice Administration, Health Insurance Plan of Greater New York, New York, N. Y.

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Jerome Pollack, B.S., Program Consultant, Social Security Dept., United Auto Workers, Detroit, Mich.

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Harry Shubin, M.D., Chairman, Dept. of Diseases of Chest, Northern Div. of Philadelphia General Hospital, Philadelphia, Pa.

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Leon I. Gintzig, M.S.H.A., Chief, Nursing Service, Dept. of Medicine and Surgery, Veterans Administration, Lexington, Ky.

Hyman Goldstein, Ph.D., Chief, Current Reports Section, Biometrics Branch, National Institute of Mental Health, Bethesda, Md.

Edward Linzer, M.A., Director of Education Services, National Assn. for Mental Health, New York, N. Y.

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Irwin Rothman, V.M.D., D.O., Chairman, Depts. of Neuropsychiatry, Delaware Valley Hospital and Juniata Park Hospital, and Consultant in Neuropsychiatry, Riverside,

Roseneath, and Logan Park Hospitals, Philadelphia, Pa.

Unaffiliated

Mary Robertson Baird, B.S., Director, Div. of Vital Statistics, State Dept. of Health, Nashville, Tenn.

Walter Erwin Boek, Ph.D., Research Anthropologist, State Dept. of Health, Albany, N. Y.

Allan B. Crunden, Jr., M.D., Private Practice, Obstetrics, Montclair, N. J.

Rose Minnick Cullen, M.S.P.H., Administrator, Children's Heart Hospital, Philadelphia, Pa.

Percy Francis Robert de Caires, M.D., M.P.H., Chief, Organization of Health Services, Pan American Sanitary Bureau, World Health Organization, Washington, D. C.

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Frank Edward Leder, M.D., Principal Medical Examiner, Workmen's Compensation Board, New York State, New York, N. Y.

George Wesley Miller, M.D., D.P.H., National Director, Blood Transfusion Service, Canadian Red Cross Society, Toronto, Ont., Canada

George Moore, M.D., M.P.H., Director, San Juan Basin Health Unit, Durango, Colo.

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Robert John Northover, M.D., D.P.H., Medical Officer, Div. of Quarantine, Immigration Medical and Sick Mariners' Service, Dept. of National Health and Welfare, Toronto, Ont., Canada

Joseph Collins Register, Professional Liaison Officer, State Board of Health, Jackson, Miss.

Luis Torres-Aguiar, M.D., Pediatrics Clinics, Public Health Unit of San Juan, Puerto Rico

Fang-chin Tsai, M.D., M.P.H., Health Officer, Medical Dept., Hong Kong, Kowloon, Hong Kong

Herman Edwin Wirth, M.D., M.P.A., Assoc. Director, Div. of Tuberculosis Control, State Dept. of Health, Albany, N. Y.

Henry Harcus Work, M.D., Assoc. Professor, Univ. of California Medical Center, Los Angeles, Calif.

Annual Meeting Employment Services Expanded

The Atlantic City meeting will witness a greatly expanded employment service. A booth area of approximately 800 square feet will be operated by the New Jersey State Employment Service in conjunction with the Vocational Counseling and Placement Service of the Association. It is provided as a means to acquaint delegates at the Annual Meeting of the professional services regularly available from all U. S. Employment Service affiliated State Employment Services and also to assure an efficient and adequate employment center for the Annual Meeting. This will in no way modify or curtail the year-round program of the Association.

Because of the streamlined nature of the service which will be given, normal placement technics of the Employment Service will, of necessity, be modified. The personal interview with the applicant and referral to a specific employer will be omitted. The Employment Service will, however, evaluate the background and qualifications of applicants and examine the specifications of employers' requests and classify and code them so that a systematic and orderly review of applicants' résumés and employers' specifications may be made.

As part of this cooperative plan the U. S. Employment Service presents the following procedures for the guidance of interested persons:

1. Every person seeking employment should prepare a brief statement, not over two pages in length, outlining his experience, type of position desired, and educational background. Employers should prepare a statement of the positions to be filled giving a description of the positions, extent of education and experience desired, salary, and other pertinent information.

2. The above information should be filed with the nearest local State Employment Service, where efforts will be made to fill the

requests immediately from information already on file.

3. Since requests may not be filled locally, a request should be made that local Employment Service offices forward all records to the New Jersey State Employment Service on October 26 for transmittal to Atlantic City.

4. All persons requesting help should register promptly at the Employment Service desk, Booths **532** and **534,** in the auditorium of Convention Hall, stating where and when they will be available for interviews. The Employment Service staff will not only attempt to arrange appointments, but will also have available for study records of position vacancies and personnel available. Although everyone is urged to file with his local Employment Service prior to October 26, it will be possible to file initially during the Atlantic City meeting. The records of the Vocational Counseling and Placement Service of the Association will be combined with the other records for the period of the Annual Meeting.

Director John J. Yencik of the New Jersey State Employment Service assures complete cooperation of the agency. Joseph A. Jordan, superintendent of the State Employment Service, has placed Joseph M. Maulano of his headquarters staff in charge of the APHA Annual Meeting employment services. Vocational counseling will be available from members of the Association staff at hours to be posted at the employment booth.

Commission on Professional and Hospital Activities

In order to conduct a medical statistical service to help hospitals simplify records and analyze them more effectively for the improvement of medical and administrative practices, a Commission on Professional and Hospital Activities has been created. Sponsoring organizations are the American College of Surgeons, American Hospital Association, American College of Physicians, and the Southwestern Michigan Hospital Council. Initial support for three years is made possible through a $260,000 grant from the W. K. Kellogg Foundation, after which it is expected that the service may be continued on a self-sustaining basis. President of the Commission is Paul R. Hawley, M.D., director of the American College of Surgeons.

The new Commission grew out of a three-year professional activity study by the Southwestern Michigan Hospital Council under the direction of Vergil N. Slee, M.D., former health officer of Barry County, who is now secretary and director of the new Commission, with headquarters in Ann Arbor.

A simplified method of collecting and reporting medical statistics for hospitals was developed with the 23 member hospitals of the Michigan Council participating. Under the system single sheets reporting the medical diagnosis and treatment completed for every discharged patient were sent to a central service bureau, tabulated by machine, and returned to the hospital as summarized records. Thus, study and comparison of the performance of individual doctors on the staff and comparison of results among hospitals were possible.

APHA membership application blank on page XXXIII

84th ANNUAL MEETING

HOW TO MAKE HOTEL RESERVATIONS FOR THE ATLANTIC CITY MEETING

A HOUSING BUREAU will be operated by the Atlantic City Convention Bureau for the 84th Annual Meeting of the APHA in Atlantic City, N. J., November 12–16. Since all requests for rooms will be handled in chronological order, you are urged to send in your reservation as quickly as possible. (See map of hotels on page 936 in the July, 1956, issue.)

Hotels and Rates *

Hotels	Rooms with Bath		Two Rooms—One Bath			Parlor, Bedroom, Bath Suite
	Single	Double	2-Persons	3-Persons	4-Persons	
Abbey †	$6.00– 8.00	$ 8.00–14.00				
Ambassador	6.00–18.00	8.00–20.00			$16.00–28.00	$20.00–45.00
Breakers	5.00–11.00	7.00–18.00		$10.00–19.00	12.00–25.00	
Brighton	6.00–10.00	8.00–14.00			22.00	22.00–28.00
Carolina Crest †	5.00– 7.00	8.00–10.00				
Chelsea	6.00– 8.00	10.00–16.00		12.00	15.00–18.00	
Claridge	7.00–15.00	11.00–19.00				36.00
Crillon †		8.00–12.00				
Dennis	7.00–10.00	10.00–22.00		18.00	22.00–30.00	35.00–45.00
Eastbourne	6.00– 8.00	8.00–11.00	$12.00	14.00	16.00	
Flanders	6.00– 7.00	8.00–12.00	12.00–13.00	16.00–18.00	18.00–20.00	
Holmhurst	4.50	8.00			28.00–32.00	
Jefferson	6.00– 8.00	8.00–12.00	12.00–14.00	14.00–16.00	16.00–22.00	
Kentucky	3.00– 4.00	6.00– 7.00	8.00	10.00		
Lafayette	6.00– 8.00	8.00–12.00				20.00–24.00
Madison	6.00– 8.00	7.00–12.00		12.00–16.00	14.00–20.00	
Mark	5.00– 7.00	6.00–10.00			16.00	
Marlborough-Blenheim	6.00– 9.00	10.00–20.00	15.00–17.00	15.00–19.00	17.00–22.00	34.00–40.00
Monticello	4.00– 5.00	5.50– 7.00		9.00	11.00–12.00	
Morton	6.00– 8.00	9.00–12.00			16.00–18.00	
New Belmont	4.00– 5.00	6.00–10.00	8.00	12.00	14.00	
Penn-Atlantic	4.00– 5.00	7.00– 8.00		11.00–12.00	14.00–16.00	17.00
President	5.00–10.00	8.00–15.00				13.00–24.00
Ritz-Carlton	6.00–10.00	8.00–22.00			24.00	35.00
Runnymede †	5.00– 8.00	7.00–10.00	15.00	17.00–19.00	18.00–20.00	
Seaside	5.00– 9.00	8.00–14.00		17.00		28.00
Senator	6.00–10.00	8.00–16.00	12.00–16.00	14.00–20.00	16.00–24.00	28.00
Shelburne	7.00– 9.00	10.00–18.00		21.00–24.00		41.00–43.00
Sterling	5.00– 6.00	8.00–10.00		12.00	14.00–16.00	

* The above rates are subject to 3 per cent Municipal Tax.

† Rate includes breakfast.

Note: Some hotels may require a deposit.

HOTEL RESERVATION FORM

PLEASE MAKE RESERVATIONS NOTED BELOW
(Please Print or Type)

First Choice..... Hotel Arrival ....., at ..... a.m. ..... p.m.

Second Choice..... Hotel Departure ....., at ..... a.m. ..... p.m.

Third Choice..... Hotel Two Rooms—One Bath for:

Single room @ $..... to $..... 2 Persons @ $..... to $.....

Double room @ $..... to $..... 3 Persons @ $..... to $.....

Suite @ $..... to $..... 4 Persons @ $..... to $.....

NAMES OF ALL OCCUPANTS: ADDRESSES:

....

....

....

....

PLEASE CONFIRM TO: (complete mailing address) .....

.....

.....

MAIL THIS FORM TO: **Housing Bureau**
16 Central Pier
Atlantic City, N. J.

University of Michigan Announces MCH Program

The University of Michigan School of Public Health at Ann Arbor has announced a program of study leading to the master of public health degree with emphasis on maternal and child health. It will be concerned with the preventive aspects of obstetrics and pediatrics and with their application in the field of public health. The program is being developed in cooperation with the Michigan Department of Health and with the assistance of the Children's Bureau, U. S. Department of Health, Education, and Welfare. A limited number of fellowships will be made available each year to properly qualified students. The program is open to physicians, nurses, nutritionists, and medical social workers who meet the admission requirements. Donald C. Smith, M.D., is associate professor in maternal and child health.

Requests for additional information should be addressed to the secretary of the Faculty, School of Public Health, Ann Arbor, Mich.

News of Affiliated Societies and Branches

Today and Tomorrow in Carolina

Approximately 600 delegates were present at the 33rd annual meeting of the South Carolina Public Health Association in Charleston, April 19–21. "The Today in Public Health" was the subject of an address by a native of South Carolina, Harry S. Mustard, M.D., professor emeritus of public health practice, Columbia University. This was followed by "The Tomorrow in Public Health" by Wilson G. Smillie, M.D., Dr. Mustard's successor as executive director of the State Charities Aid Association in New York City. The meeting was opened by the retiring president, Blanche R. Speed, district orthopedic nurse of the State Health Department.

The state health officer, G. S. T. Peeples, M.D., told the convention that some of the state's pressing future needs were an accredited college program for nurse training, field training for tuberculosis nurses, a broader civil defense nursing program, increased home nursing, and more community health service.

At the final general session Imre Kovacs, author and lecturer who had been studying social and economic conditions in Europe, spoke on "America Just Beginning." The hitherto annual banquet was bypassed at this meeting in favor of a list of suggested night clubs, restaurants, and other entertainment requested by delegates.

Officers elected are:

President: J. Tennent Hane, administrator, Calhoun County Health Department
President-Elect: Somers B. Pringle, administrator, Beaufort County Health Department
Vice-President: Betty Ficquett, nurse consultant, Maternal and Child Health Division, State Department of Health
Secretary: Carie B. DuPriest, clerk, Tuberculosis Control Section, State Department of Health
Treasurer: Cecil C. Seigler, accountant, State Department of Health
Representative to APHA Governing Council: G. S. T. Peeples, M.D., State Health Officer.

Missouri Meets in Kansas City

The Missouri Public Health Association met 300 strong in Kansas City, June 11–13, and it was voted one of the best meetings in years. Ralph Emerson Duncan, M.D., president of the association, and director of the Duncan Laboratories in Kansas City, made the opening address highlighting the theme of coordinated community planning. One day was devoted to section meetings.

Among the highlights were the presentation of a dental health teaching project for first graders, including a puppet show, by Catherine Hidy of the Little Rock (Ark.) Health Department. At the banquet Otis L. Anderson, chief, Bureau of State Services, U. S. Public Health Service, spoke on "Planning for Today's Health Needs" emphasizing particularly joint planning through community councils or health committees. Here also the W. Scott Johnson Award was presented to John W. Williams, Jr., M.D., for his long and tireless work toward the goal of improved health services for every resident. Dr. Williams was until 1950 for many years director of personnel administration and of local health services in the State Division of Health.

Officers elected are:

President: Helen E. Kinney, R.N., director, Bureau of Nursing, Missouri Division of Health, Jefferson City
President-Elect: E. R. Price, D.V.M., public

health veterinarian, Missouri Division of Health

Vice-President: W. G. Green, executive director, Missouri Heart Association, Columbia

Secretary-Treasurer: Nadia Craver, Director's Office, Missouri Division of Health

Representative to the APHA Governing Council: J. Earl Smith, M.D., director, St. Louis Division of Health.

Montana, a New Affiliate, Meets

The Montana Public Health Association held its 38th Annual Meeting, its first as an APHA affiliate, jointly with the Rural Health Section of the Montana Medical Association at Helena, June 5–6, with the emphasis on preventing home accidents. "Why Must Our Children Die from Home Accidents?" was the subject of the keynote address by Edward Press, M.D., field director of the American Public Health Association.

G. D. Carlyle Thompson, M.D., executive officer of the State Board of Health, reviewed the communicable disease situation in the state. More effective immunization, more tuberculosis cases under hospital care were among the important needs. No smallpox for two years, immunization of cats and dogs against rabies, a new state diagnostic heart center, and a five-to-seven-year cleft palate program supported by the Children's Bureau are on the credit side.

Rural health in Montana and the Northwest was discussed by Aubrey Gates of the American Medical Association. The use of sewage lagoons to prevent stream pollution was the subject of one of the discussions as well as of a field trip. The abundance of open space makes that unusually inexpensive method of sewage treatment especially suitable in this state.

The officers elected in 1955 for a two-year term are:

President: Robert Mattson, Billings

Vice-President: C. W. Hammer, M.D., health officer, Bozeman-Gallatin County

Those elected in 1956 for a two-year term are:

Secretary: Emma Wright, Havre

Treasurer: Vernon Sloulin, Division of Environmental Sanitation, State Health Department.

Three Millenia of Service

More information has come about the public health workers in the state who received service pins from the North Carolina Public Health Association in 1956 for completing 25 more years of service. They number 110, of whom 63 are workers in 24 local health departments; 31 in the State Health Department, and 16 in voluntary health agencies. Their average length of service is 31 years and their total years of service, if laid end to end, would carry them way back beyond the Christian era, or 1456 A.D.

Ohio Has a Regional Meeting

The Northeast District of the Ohio Public Health Association is holding its annual meeting in Akron on October 19. The theme is "Evaluation of Health Services as Related to Regional Planning."

News About Affiliate Periodicals

In mid-August secretaries of the Affiliated Societies were asked to answer six simple questions about any periodical publications they publish. The purpose is a roundup of news about affiliate publications, which affiliates prepare them, how often, who gets them, etc. Replies have begun to come in to the Membership Department of the Association. It is hoped that each secretary of an Affiliated Society will reply so that the definitive story can be told in this section of the November or December Journal.

APHA AFFILIATED SOCIETIES AND BRANCHES

Society and Secretary

ARIZONA PUBLIC HEALTH ASSOCIATION, Evelyn Longstreth, 225 W. Washington, Phoenix
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Constance Cavender, Alameda Co. Health Dept., 15000 Foothill Blvd., San Leandro
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Gerald A. Heidbreder, M.D., 241 No. Figueroa St., Los Angeles
COLORADO PUBLIC HEALTH ASSOCIATION, Margaret D. Lewis, 659 Cherokee St., Denver
CONNECTICUT PUBLIC HEALTH ASSOCIATION, Mrs. Claire Reinhardt, 310 Cedar St., New Haven
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, San Rafael 1170, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Nathan J. Schneider, Ph.D., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, J. F. Hackney, M.D., 224 Central Ave., S.W., Atlanta
IDAHO PUBLIC HEALTH ASSOCIATION, Mrs. D. W. McDougal, P. O. Box 563, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William B. Hixon, Evanston Health Dept., Evanston
IOWA PUBLIC HEALTH ASSOCIATION, Mary L. Wombacher, State Dept. of Health, Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, Evelyn Ford, State Board of Health, State Capitol, Topeka
LOUISIANA PUBLIC HEALTH ASSOCIATION, Mrs. Velma Brusse, Dept. of Health, New Orleans
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Muriel Bliss Wilbur, 695 Huntington Ave., Boston
MICHIGAN PUBLIC HEALTH ASSOCIATION, Maurice J. Mayer, 405 Hollister Bldg., Lansing
MINNESOTA PUBLIC HEALTH CONFERENCE, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, Mrs. Cassie S. Feagin, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Mrs. Harriet Patterson, Thompson Falls
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Robert Howell, 305 Terrace Ave., N. E., Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Joseph Kadish, 164 W. 174th St.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mary C. Egan, New York State Department of Health, Albany, N. Y.
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Betty E. Briggs, State Board of Health, Raleigh
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Mrs. Cora Shelstad, Court House, Finley
OHIO PUBLIC HEALTH ASSOCIATION, Virginia Jones, Ohio Dept. of Health, Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, 3400 North Eastern, Oklahoma City
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Robert H. Conn, 303 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Conchita Carrasquillo, Apartado 211, San Juan
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Carrie B. Du Priest, State Board of Health, Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Louis E. Remily, State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, H. E. Drumwright, City Health Dept., Dallas
UTAH PUBLIC HEALTH ASSOCIATION, Mrs. Mildred Engar, Salt Lake City Board of Health, 115 So. State, Salt Lake City
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Muriel Thompson, State Dept. of Health, Smith Tower, Seattle
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Harry M. Huff, State Dept. of Health, Charleston
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, 1 W. Wilson St., Madison
SOUTHERN BRANCH, A.P.H.A., Joseph M. Bistowish, M.D., P. O. Box 1117, Tallahassee, Fla.
WESTERN BRANCH, A.P.H.A., Mrs. L. Amy Darter, State Dept. of Health, 2151 Berkeley Way, Berkeley, Calif.

Radiation Hazards to Man

A special committee of the British Medical Research Council at the request of the Prime Minister has studied the possible hazards to man that may exist from the use of radioactive materials. The report of the committee, "The Hazards to Man of Nuclear and Allied Radiations," published in June, 1956, considers the effects of radiation on the health of the individual and the possible genetic consequences of radiation to the population as a whole as well as to the individual and his descendants. There are some eight chapters in the report and 14 appendixes dealing with the specific aspects of the over-all study. Available from Her Majesty's Stationery Office, London, 5s, 6d.

Employment Service

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication.

POSITIONS AVAILABLE

The Pennsylvania Department of Health announces vacancies in the positions listed below. All positions are under the merit system. Excellent promotional opportunities and an extensive training program provide the basis for real professional growth. Comparable education and training may be substituted for the stipulated minimum requirements. For applications or further information for any of the following Pennsylvania vacancies, please write Mr. Andrew L. McCabe, Personnel Director, Pennsylvania Dept. of Health, Harrisburg, Pa. Applications should be postmarked not later than November 23, 1956.

Sanitary Engineers—**Sanitary Engineer IV,** $7,055–$9,011. Serves as regional sanitary engineer to direct activities in the fields of water supply, sewerage and sewage disposal, and industrial waste treatment, or as chief, Sewerage Section, to plan and coordinate the state-wide program of public sewerage and sewage disposal. Four years of responsible experience, including one year in a supervisory capacity; B.S. in sanitary or public health engineering. **Sanitary Engineer III,** $6,090–$7,772. Serves as assistant regional engineer or assistant section chief, assisting in directing the sanitary engineering program at the central office or regional level. Three years of responsible experience and B.S. in sanitary or public health engineering.

Sanitarians or Engineers—**Sanitarian IV,** $6,390–$8,163. Serves as chief of the Food Sanitation Section, Vector Control Section, Accident Prevention Section, or Housing Section, directing a state-wide program in these fields. Four years of responsible experience, including one year in a supervisory level and one year in the field of specialization; B.S. in the biological sciences or sanitary or public health engineering. **Sanitarian III,** $5,529–$7,055. Directs a state-wide program of camp and school sanitation. Three years of responsible experience in public health environmental sanitation; B.S. in the biological sciences or sanitary or public health engineering. **Sanitarian II,** $4,773–$6,090. Serves as supervisor of a generalized sanitation program in an assigned region. One year of experience in public health environmental sanitation; B.S. in the biological sciences or sanitary or public health engineering.

Public Health Nurses—**Public Health Nurse IV,** $6,716–$8,580. Assistant director of nursing for administration. Serves as assistant director of the bureau, responsible for coordinating and directing a generalized program of public health nursing on a state-wide basis. Four years of public health nursing experience in a generalized program, including two years in an administrative capacity; B.S., completion of an approved course in public health nursing and M.P.H. **Public Health Nurse III,** $5,268–$6,716. Serves as regional supervisor in a generalized public health nursing program. Three years of public health nursing experience, including one year in a supervisory capacity; B.S. and completion of an approved course in public health nursing. **Public Health Nurse II,** $4,773–$5,803. Serves as supervisor of a generalized public health nursing program in an assigned region. Two years of public health nursing experience; B.S. and completion of an approved course in public health nursing. **Public Health Nursing Consultants in Maternal and Child Health, Mental Health, Communicable Disease, Cancer, Industrial Nursing and Tuberculosis,** $5,268–$6,716. Serves as a public health nursing consultant in the field of specialization to public health nurses and other personnel in a state-wide public health nursing program. Three years of experience in a generalized public health nursing program or in the field of specialization, including one year in a supervisory capacity; B.S., completion of an approved course in public health nursing, a course in teaching methods and an advanced program of study in the field of specialization.

Health Educators—**Public Health Educator III (Media),** $6,390–$8,163. As chief of the Media Section in the Division of Public Health Education, develops and administers a program involving the preparation and distribution of health education media. Three

years of responsible experience in public health education, including two years of special experience in the field of health education media; bachelor's degree and M.P.H. **Public Health Educator II,** $5,529–$7,055. Plans, organizes, and promotes a generalized program of public health education in an assigned region or directs a state-wide program of health education in a specialized field such as alcoholism, cancer, or heart and metabolic diseases. Two years of responsible experience in public health education; bachelor's degree and M.P.H.

Physical Therapists—**Physical Therapist III,** $5,007–$6,390. Develops and directs a state-wide program of physical therapeutic activities in the Division of Maternal and Child Health. Four years of professional experience as a physical therapist, including two years in a supervisory capacity; bachelor's degree with major course work in physical therapy; eligibility for license to practice physical therapy in Pennsylvania. **Physical Therapist II,** $4,329–$5,529. Directs a program of physical therapeutic activities in an assigned region. Two years of professional experience as a physical therapist; bachelor's degree with major course work in physical therapy; eligibility for license to practice physical therapy in Pennsylvania.

Air Pollution Specialists—**Air Pollution Control Specialist III,** $7,407–$9,454. Serves as chief of the Air Pollution Control Section in the Division of Industrial Hygiene; plans and directs a state-wide program for the control and elimination of air pollution health hazards. Four years of technical experience in air pollution control work, including one year in a supervisory capacity; B.S. in civil, chemical, or mechanical engineering. **Air Pollution Control Specialist II,** $5,529–$7,055. Supervises and participates in field investigation of air pollution complaints. Two years of experience in air pollution control work or in industrial engineering; B.S. in civil, chemical, or mechanical engineering.

Industrial Hygiene Physician—$9,011–$11,501. Serves as a consultant and adviser to industrial management in the medical phases of an industrial hygiene program. Two years of experience in the practice of medicine, including one year of practice related to industrial operations and occupational diseases; eligibility for license to practice medicine in Pennsylvania.

Public Health Supervisor—for newly created position to direct a joint city-county nursing service. Generalized program, including school nursing. Degree and public health supervisory experience required. Salary open, mileage allowed. Staff position also open. Apply Stearns County Public Health Nursing Service, Courthouse, St. Cloud, Minn.

Biostatistican—A vacancy exists in the newly organized Division of Biostatistics, Department of Public Health, Faculty of Medicine, University of British Columbia, Vancouver 8, B.C., Canada. Applicants must have a basic degree in arts or science and should have had considerable training and experience in the field of statistics. Preference will be given to applicants with a postgraduate qualification in biostatistics. The appointee will be required to organize a program of research and teaching. Salary according to qualifications and experience. Inquiries should be directed to Dr. James M. Mather, Professor of Public Health, at the above address.

Full-Time Health Officer—for central California county. New building, well staffed. Position now open. Salary range $741–$888 per month. Applicant must be a citizen and California Board eligible, with training in public health work. Write Kings County Board of Supervisors, Hanford, Calif.

Psychiatrist—for the San Francisco Bay area. To assist in developing a community mental health program, including but not limited to, consultative services to staff of health department, other agencies, and professional groups. Must be a United States citizen, eligible for California license and Board eligible. Prior experience and interest in community mental health programs are desirable. Apply to: James C. Malcolm, M.D., M.P.H., Health Officer, Alameda County Health Dept., 15000 Foothill Blvd., San Leandro, Calif.

Public Health Physician—Annual salary $8,352–$10,332. Requirements: Some public health experience necessary. Duties: To assist in administration of a major division in the Alameda County Health Department, San Francisco Bay area. Apply: James C. Malcolm, M.D., M.P.H., Health Officer, Alameda County Health Dept., 15000 Foothill Blvd., San Leandro, Calif.

Assistant Health Officer—Annual salary $9,300–$11,508. Requirements: M.P.H. degree and public health experience. Duties: To administer a major division in the Alameda County Health Department, San Francisco Bay area. Apply: James C. Malcolm, M.D., M.P.H., Health Officer, Alameda County Health Dept., 15000 Foothill Blvd., San Leandro, Calif.

Director, Maternal and Child Health Services—Position now open. Graduate training in public health desirable. Salary range $9,420–$11,820. Retirement plan, three weeks' annual vacation. E. M. Bingham, M.D., San Joaquin Local Health District, Stockton, Calif.

Director of Health—For the city of Waterbury, Conn. Must have degree and experience in public health administration and be eligible for Connecticut licensure. Write to Christopher E. Dwyer, M.D., President Board of Health, Waterbury, Conn.

Director of Public Health Department—City-county unit, Des Moines, Iowa. Medical degree with training and experience in public health. Salary open. Apply: Personnel Office, Room 102, City Hall, Des Moines, Iowa.

Public Health Nurse—$370, $391, $413, $436, starting salary dependent upon qualifications. Generalized program; county car or eight cents per mile; 37½-hour week. For further information write to: Garold L. Faber, M.D., M.P.H., Director, Butte County Health Dept., P. O. Box 1100, Chico, Calif.

Qualified Public Health Nurse—Must be eligible for California certificate. Salary $376–$458; travel allowance for use of private car. Write to San Benito County Health Dept., Health Center Bldg., Hollister, Calif.

Public Health Nurse—generalized program in suburban Southern California county of 400,000 population. Well supervised all-around experience in a complete health department housed in its own new air-conditioned building. Pleasant year-round climate. Near beaches, mountains, other recreational and cultural activities. County car furnished or seven and a half cents per mile for your own car. Three-week annual vacation, good sick leave and retirement benefits. Starting salary $375, merit advancement after six months to $395, subsequent annual increases to $464. Write to Orange County Personnel Dept., 644 North Broadway, Santa Ana, Calif.

Public Health Nursing Supervisor—Generalized nursing program in a large city health department; diploma and collegiate student affiliation. Salary open for discussion, based on experience and qualifications; 40-hour week; 12 working days' vacation; sick leave; pension. Bachelor's degree, approved PHN course and three years' experience required, one of which should have been in a supervisory capacity. Write: Bureau of Public Health Nursing, Room 703 Municipal Bldg., P. O. Box 1877, Baltimore 3, Md.

Public Health Nurse—Generalized program and school nursing. Beginning salary $4,400, annual increments, 37½-hour week, four weeks' paid vacation, sick leave, $35 a month car depreciation plus mileage allowance or drive county car. Apply Director, Eaton County Health Dept., Charlotte, Mich.

Public Health Nurse Supervisor—One of four general supervisors in a combination agency employing 42 nurses. Working with physical therapist, nutritionists, and other specialists. Field training center for university nursing students. Good personnel policies. Salary range depending on qualifications. Write Sophie E. Fevold, Executive Director, The Visiting Nurses Association, City Bureau of Nursing, 401 Municipal Bldg., Dayton 2, Ohio.

Public Health Nurses—for staff positions in a generalized public health nursing service. Good working conditions, retirement, and Social Security benefits, annual vacation, and sick leave. Apply Department of Personnel, Arlington County, 2049–15th St., North, Arlington, Va.

Industrial Hygienist—Well established chemical manufacturers in Midwest have opportunity for an industrial hygienist to help supervise and carry out an expanding health program. Experience with hazards of radioactivity essential. Please submit full details of background and experience in letter to **Box IH-7,** Employment Service, APHA.

Public Health Engineers—Grades I, II, III—Salaries $360–$625. Bachelor's degree in engineering required. Starting salary dependent on qualifications and experience. Work is in state-wide stream pollution control program. Write State Board of Health, Laboratory Bldg., Helena, Mont.

Junior Engineers—Immediate openings. Salary range $4,650–$5,760. Location: Long Island area, New York. Requirements: degree in civil, sanitary, public health engineering. Apply: H. F. Udell, State of New York Conservation Dept., 65 West Sunrise Highway, Freeport, N. Y.

Sanitary Chemist—Immediate opening. Salary range $4,430–$5,500. Location: Long Island, N. Y. Requirements: Degree in chemistry, or biological sciences with chemistry major, and two years' experience in sanitary chemistry. Apply: H. F. Udell, State of New York Conservation Dept., 65 West Sunrise Highway, Freeport, N. Y.

Chemists—Several current vacancies for both experienced and inexperienced. Attractive salaries, with regular pay increments, depending upon qualifications. Requires degree with minimum of minor in chemistry. M.A. or Ph.D. desirable for higher levels. Paid vacation, sick leave benefits, Social Security and state pension plan. Write to Michigan Civil Service, Lansing 13, Mich.

Public Health Bacteriologist—Position available October 1. Santa Barbara County Health Department, Santa Maria office. New and well equipped laboratory. Salary range from $355–$433. Must be qualified bacteriologist with California certificate. Contact Joseph T. Nardo, M.D., Health Officer, P. O. Box 119, Santa Barbara, Calif.

Bacteriologists—From $3,946.32–$5,011.20 yearly. Six current vacancies in State Health Department with outstanding reputation. No experience required. Requires degree with specialization in the physical sciences or medical technology with courses in bacteriology. Longevity bonus plan. Paid vacation, sick

leave benefits, Social Security and state pension plan. Write to Michigan Civil Service, Lansing 13, Mich.

Shellfish Bacteriologist—Located in small coastal town. Complete charge of laboratory. Liberal vacation, sick leave and retirement. Starting salary $4,512, with increments to $5,640. Requirements: Degree with major studies in biological sciences and two years' experience in shellfish work. Write Director of Personnel, Virginia State Health Dept., Richmond 19, Va.

Public Health Nutritionist—Develop and conduct program in district area, including consultation to nurses, teachers, social workers, small hospitals, nursing homes, children's institutions; training programs; community studies and education. Master's degree, intership, two years' hospital and community nutrition experience. $4,992–$5,772 plus travel expense. Vacation, sick leave, Social Security, retirement. Dr. Amy Louise Hunter, State Board of Health, Madison, Wis.

Director, Local Health Services—Los Angeles City Health Department. Position involves administering nine local public health districts consisting of community populations from approximately 100,000 to 600,000 residents with programs of communicable disease control, maternal and child health, health education, and environmental sanitation. District responsibilities include supervising clinics for tuberculosis, venereal disease, child health and maternity services. Each district staff consists of a district health officer, clinic physicians, public health nurses, a nutritionist, a medical social worker, sanitarians, nurses, and clerical staff. Starting salary $1,048, with a range to $1,170. Benefits include vacation and sick leave policies, transportation, and retirement programs. Write: George M. Uhl, M.D., Health Officer, Los Angeles City Health Dept., 111 E. First St., Los Angeles 12, Calif.

SANITARIAN

Foreign Employment

Degree in Sanitary Sciences, Sanitary Engineering and/or master's degree in Public Health plus 3–5 years' experience in Sanitary Engineering or Environmental Health. For Company operations in Saudi Arabia.

Write giving full particulars regarding personal history and work experience.

Recruiting Supervisor, Box 187

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
New York 22, New York

EPIDEMIOLOGIST

Foreign Employment

For MAJOR U. S. OIL COMPANY with extensive Middle East operations. Must be U. S. citizen and graduate of accredited medical school and have M.P.H. degree or equivalent plus 3 years' experience. Candidates under 40 years of age preferred.

Write outlining personal history and work experience. Please include telephone number.

BOX PH 66,
Employment Service, APHA

Los Angeles City Health Department positions—**Senior Public Health Bacteriologist** ($417–$516); **Public Health Nurse** ($395–$489); **Sanitary Engineering Associate** ($545–$677); **Sanitarian** ($395–$489); **Medical Social Worker** ($375–$464); **Nutritionist** ($395–$489); **Clinic Physicians** ($715–$797). For detailed information write: George M. Uhl, M.D., Health Officer, Los Angeles City Health Department, 111 E. First St., Los Angeles 12, Calif.

Public Health Statistician—$395–$489 month. **Senior Public Health Statistician**—$464–$575 month. Los Angeles City Health Dept. Write Room 5, City Hall, Los Angeles 12, Calif.

Staff positions available for **Public Health Nurses,** Santa Barbara County, Calif. Salary range, $338–$412. Generalized program, including schools. Please write to Petronilla Commins, Director, Public Health Nursing, Santa Barbara County Health Dept., Santa Barbara, Calif.

Public Health Nurses—for staff positions in a generalized public health nursing service. Good working conditions, retirement, and Social Security benefits, annual vacation and sick leave. Apply Dept. of Personnel, Arlington County, 2049 – 15th St., North Arlington, Va.

Sanitarians—Immediate openings. Beginning salary $375 per month, with increases to $459 per month in three years. Generous vacation, sick leave, and retirement provisions. County car furnished. Excellent working conditions in the fastest growing county in the San Francisco Bay area. Requirements: eli-

gibility for or registration as sanitarian in California; bachelor's degree in sanitary or allied science; and civil service (APHA) examination. Apply: Charles B. Ruegnitz, Chief, Bureau of Sanitation, Alameda County Health Dept., 15000 Foothill Blvd., San Leandro, Calif.

A leading national voluntary health association has openings in various parts of the country in many categories—**Field Workers, Health Educators, Executive Secretaries, Executive Directors.** Master's degree in health or related fields desirable, but not essential. Some experience in public health, community organization or administration of voluntary health agency required. Positions and salaries commensurate with education, experience, and placement. Please send résumé to **Box C-31,** Employment Service, APHA.

International Vacancies

Malariologists, Public Health Administrators, Public Health Engineers, Public Health Nurses, Nurse Educators—There are several positions open in Latin America and the Caribbean for persons in the above categories. The essential qualifications are public health training and extensive field experience. Malariologists need considerable experience in malaria programs and use of the new residual insecticides. Nurses require advanced training in public health nursing or nursing education, as well as extensive experience in supervision, administration and/or teaching. Spanish is desirable in nearly all cases. Salaries and allowances range from $6,000–$11,000 per annum. For further particulars, write to the Personnel Officer, PASB/WHO, 1501 New Hampshire Ave., Washington 6, D. C.

POSITIONS WANTED

Public Health Engineer—Desires employment in city or county health department or combination. Good technical training, unusually wide experience, capable and reliable. Now employed in supervisory capacity. Write **Box E-34,** Employment Service, APHA.

Education Director or related position—Biology teacher desires position with official or voluntary health agency. B.S. and master of health, physical education and recreation. Additional graduate studies in public health education at Columbia University. Participation in health work shops and complete courses in advanced bacteriology. Military service included prevention and control of communicable diseases. Several years' experience in safety and accident prevention in medium-sized city. Write **Box HE-78,** Employment Service, APHA.

Public Health Educator—(Female)—M.S.P.H.; 13 years' experience in official and voluntary public health agencies, with emphasis on community organization, teaching experience. Wants position giving consultation and/or direct service in community organization for a public health program under either voluntary or official auspices. Will travel, but prefers to live in Washington, D. C., area. Write **Box HE-79,** Employment Service, APHA.

Medical Bacteriologist—Ph.D., excellent background, 15 years' responsible research, teaching, diagnostic bacteriology and administrative experience in colleges, universities, and hospitals; ten years' TB research, seven years' director of research. Desires responsible TB research, teaching and/or research position, preferably in medical school or hospital, or position as bacteriologist-in-charge, chief or director of research in some area of medical bacteriology, preferably TB. Write **Box L-52,** Employment Service, APHA.

Bacteriologist — Ph.D., age 35, well rounded background in medical and public health bacteriology. Can offer proved abilities in research, administration, and teaching for a challenging position with medical school, industry, or public agency. Write **Box L-53,** Employment Service, APHA.

—PENNSYLVANIA DEPARTMENT OF HEALTH—

Public Health Opportunities in Pennsylvania

REGIONAL MEDICAL DIRECTOR—$11,501–$13,979

Public Health Physician III—To develop and administer a comprehensive program of public health services in a region of several counties. Requirements: Five years of responsible experience in public health administration; eligibility for certification by the American Board of Preventive Medicine and Public Health; eligibility for licensure in Pennsylvania.

CHIEF, INFANT AND PRESCHOOL SECTION—$10,432–$11,501

Public Health Physician I, Pediatrics—In the Division of Maternal and Child Health, to coordinate and administer a state-wide public health program for infants and preschool children. Requirements: Four years of training and experience in pediatrics, including completion of the formal training requirements for certification by the American Board of Pediatrics; eligibility for licensure in Pennsylvania.

CHIEF, SCHOOL HEALTH SECTION—$10,432–$11,501

Public Health Physician I, Pediatrics—In the Division of Maternal and Child Health, to coordinate and administer a state-wide public health program for children of school age. Requirements: Four years of training and experience in pediatrics, including completion of the formal training requirements for certification by the American Board of Pediatrics; eligibility for licensure in Pennsylvania.

CHIEF, CANCER CONTROL SECTION—$10,432–$11,501

Public Health Physician I, Cancer—In the Division of Chronic Diseases, to develop and administer a state-wide program of cancer control. Requirements: Four years of professional training and experience, including completion of the formal training requirements for certification by the appropriate medical specialty board; eligibility for licensure in Pennsylvania.

CHIEF, HEART AND METABOLIC DISEASES SECTION—$10,432–$11,501

Public Health Physician I, Heart and Metabolic Diseases—In the Division of Chronic Diseases, to develop and administer a state-wide public health program in the field of heart and metabolic diseases. Requirements: Four years of professional training and experience, including completion of the formal training requirements for certification by the appropriate medical specialty board; eligibility for licensure in Pennsylvania.

All positions under the merit system; real opportunity for professional training and advancement; excellent retirement system; liberal sick leave, vacation, and holiday benefits. Comparable education and training may be substituted for the stipulated requirements for these positions.

For further information or applications, please contact Dr. C. L. Wilbar, Jr., Deputy Secretary of Department of Health, or Mr. Ralph Tive, Executive Director, Civil Service Commission, Harrisburg, Pa.

FINAL DATE FOR FILING APPLICATIONS:
NOVEMBER 23, 1956

—PENNSYLVANIA DEPARTMENT OF HEALTH—

Environmental Health Opportunities in Pennsylvania

Sanitary Engineering

DIRECTOR—$9,454–$12,075

Sanitary Engineer VI—To administer a comprehensive state-wide program of sanitary engineering, involving water supplies, sewerage and sewage treatment, industrial waste treatment and mine drainage. Requirements: Eight years of responsible professional experience, including three years in an administrative capacity; B.S. in engineering and M.P.H.

ASSISTANT DIRECTOR—$8,163–$10,432

Sanitary Engineer V—Serves as assistant to the director. Directs and coordinates the sanitary engineering program on a state-wide and regional basis. Requirements: Six years of responsible professional experience, including two years in an administrative capacity; B.S. in engineering and M.P.H.

Environmental Sanitation

ASSISTANT DIRECTOR—$7,407–$9,454

Sanitarian V—Serves as assistant to the director of the Division of Sanitation. Directs and executes Pennsylvania's environmental sanitation program in the fields of food sanitation, camps and schools, vector control, and individual water supplies and sewage disposal facilities. Requirements: Five years of responsible professional experience, including two years in an administrative capacity; B.S. in engineering or biological sciences and M.P.H.

Air Pollution

CHIEF, AIR POLLUTION CONTROL SECTION—$7,407–$9,454

Air Pollution Control Specialist III—To administer the state-wide air pollution control program in the Division of Industrial Hygiene. Requirements: Four years of responsible professional experience, including one year in an administrative capacity; B.S. in engineering and M.P.H.

Environmental Safety

DIRECTOR, DIVISION OF ENVIRONMENTAL SAFETY—$8,163–$10,432

Sanitarian V—To administer a state-wide program of environmental safety in the fields of housing and accident prevention. Requirements: Five years of responsible experience in environmental sanitation, including two years in environmental safety work and two years in an administrative capacity; B.S. in engineering or the biological sciences and M.P.H.

All positions under the merit system; real opportunity for professional training and advancement; excellent retirement system; liberal sick leave, vacation and holiday benefits. Comparable education and training may be substituted for the stipulated requirements for these positions.

For further information or applications, please contact Mr. Karl M. Mason, Director of the Bureau of Environmental Health, or Mr. Ralph Tive, Executive Director, Civil Service Commission, Harrisburg, Pa.

FINAL DATE FOR FILING APPLICATIONS:
NOVEMBER 23, 1956

—THE COMMONWEALTH OF PENNSYLVANIA—
DEPARTMENT OF WELFARE

Invites You to Join in Building One of the Finest Mental Health Programs in the Nation

Adequate funds have been appropriated to fill all vacancies. Salary scales are equal to, or better than, most. Professional direction and leadership are sound. All appointments are being made on the basis of qualifications alone.

LOOK INTO THE OPPORTUNITIES PENNSYLVANIA OFFERS *YOU!* BE A PART OF THIS EXCITING DEMONSTRATION OF SOUND MENTAL HEALTH ACTION!

For further information, write:

PROFESSIONAL RECRUITMENT CENTER
DEPARTMENT OF WELFARE
COMMONWEALTH OF PENNSYLVANIA
HARRISBURG, PA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

WANTED—(a) Chief health officer, university city, East; $14,000. (b) Epidemiologist; preventive medicine staff, foreign operations, leading industrial company; $14,000 plus $4,000 family maintenance; federal tax free. (c) Director, university student health department; 3,000 students; West. (d) Health consultant to teach hygiene and school health, state university; public health nurse preferred. (e) Executive director; qualified to direct threefold program covering research, education, rehabilitation; New England; $6,000–$7,500. (f) Nursing instructor to establish and direct health program, liberal arts college, California; $5,200–$5,500. (g) Public health nurse qualified for important faculty position, large university; East. (h) Nursing director; generalized public health program, school services; college town, California; $5,400–$6,500. (i) Dental health education coordinator; M.S. or Ph.D.; five years' experience health education; $8,000–$10,000; West. (j) Sanitarian; degree in sanitary sciences, public health or engineering; three years' experience required; foreign operations, major industrial company. (k) Health inspector experienced meat and dairy products inspection; foreign. (l) Executive and assistant directors, educational and campaign directors, field representatives; various sections of country; one of leading health organizations.

OPPORTUNITIES WANTED

WANTED—Opportunities for public health physicians, nurses, educators, engineers, public health laboratory personnel. Candidates in all parts of the country, available for administrative, academic, and staff appointments. Negotiations strictly confidential.

News from the Field

WHO News

Sanitary Engineering Congress

The fifth biennial Inter-American Congress of Sanitary Engineering was held in Lima, Peru, March 19–26. It was organized by the Peruvian Section of the Inter-American Association of Sanitary Engineering (AIDIS) assisted by the Pan American Sanitary Bureau and the Institute of Inter-American Affairs. Of the 250 persons attending, 100 were from Peru, 115 from 16 other countries with several each from PASB and IIAA.

These biennial conferences represent the principal forum for exchange of ideas among sanitary engineers in the Americas and are attended by sanitary and civil engineers in official positions and in private consultant service. They are supported by PASB/WHO in order to encourage the development of sanitary engineering units in national health administrations.

It was brought out that about 20,000 sanitary inspectors and 10,000 water works operators are needed in Latin American countries. With these it might be possible to develop adequate supplies of clean water, improve garbage and sewage disposal, and sanitary food handling, and in this way reduce the incidence of intestinal diseases, currently the major cause of infant mortality in the area.

More than 50 papers were presented at the March meeting including discussions of the problems arising from the new atomic energy industry. Among 27 resolutions approved were those urging governments to support the hemisphere-wide malaria education program, to intensify rural sanitation programs, to establish permanent training centers for sanitary inspectors, to provide funds for fellowships, and to study the sanitary utilization of sewage waste for irrigation and the use of oxidation ponds for sewage disposal.

Rafael Urrutia, director of Puerto Rico's Water Supply Authority, was elected president of AIDIS. The sixth congress will be held in Puerto Rico in 1958.

India's Penicillin Plant Opened

India's $4,000,000 penicillin plant at Pimpri was formally opened on August 2, with Prime Minister Nehru as honored guest. At present, production of more than 1,000 pounds per month has been achieved meeting about one-third of India's penicillin needs. Eventual capacity is 2,500 pounds. It is the only penicillin plant in South Asia.

The Indian government has borne the entire expense of land and building construction and provides the technical staff; UNICEF supplied $850,000 in machinery and precision equipment; UN Technical Assistance Administration's contribution totaled $300,000 for training abroad of Indian technical personnel and for foreign technical experts in designing, erecting, and bringing the plant into operation.

UNICEF Famine Aid to Pakistan

UNICEF's Executive Board has allocated more than a half million dollars ($594,000) to provide a daily rice

ration for children and mothers in East Pakistan. There, famine conditions are believed to be the worst since 1943 when over two million people died in the province of Bengal. Present conditions, with a rice shortage of 700,000 tons, are due to the devastating floods of 1954 and 1955, as well as insect destruction.

Fluoridation Notes

With the fluoridation of the Greater Cleveland water supply, which began on July 2, 1956, an additional 1,200,000 persons in a 500-square-mile area including 60 suburbs were added to those having the benefit of this service. The national score is now 1,232 communities with a total population of 25,564,000. Cleveland's fluoridation was begun only after legal delays in which the objections were carried both to Ohio courts and the United States Supreme Court. Objections not sustained.

In a ten-year study of Marshall, Tex., whose water supply has been fluoridated for that period, the Texas State Health Department found a 54 per cent reduction in tooth decay among children from seven to 15 years of age. Annual examinations show that Marshall children are having progressively less dental decay, with greater benefits to younger children who have had fluoridated water all their lives. Ten years ago the average eight-year-old had 3.04 decayed teeth; today he has 0.6.

A survey in Madison, Wis., following five years of fluoridation indicates a 20 per cent increase in the number of kindergarten children having no caries experience and a reduction of 45 per cent in the number of teeth decayed, indicated for extraction, and filled deciduous.

At its first constitutional convention in December, 1955, AFL-CIO endorsed fluoridation as follows: "We support the addition of fluorides to water as an excellent preventive step against tooth decay."

In Oregon a referendum on fluoridation was held in each of 12 communities with approval in only two—McMinnville and Roseburg with a combined population of 15,000.

McCall's Magazine, which calls itself "The Magazine of Togetherness," discusses the fluoridation issue in "The Fluoridation Scare" by Robert L. Heilbroner. It argues for the reasonableness of fluoridation pointing out once more, as has been done before, the essential suspicion and anti-intellectualism of the opposition.

Ruth Hubbard Foundation Formed

A group of her friends have established the Ruth Weaver Hubbard Foundation in memory of the late Miss Hubbard. The foundation, through a scholarship fund, will help selected nurses who possess some of the qualities for which Miss Hubbard was best known, to prepare for nursing leadership positions through advanced education, or provide opportunities for selected nurses to pursue special studies in nursing.

Miss Hubbard began her career as a staff member of the Brooklyn Visiting Nurse Association. Later she was instructor at the Yale School of Nursing, then education director of the New Haven Visiting Nurse Association. In 1929 she became director of the Visiting Nurse Society of Philadelphia, a post which she held until the time of her death early in 1956. During these years she found time to write numerous articles and papers on nursing and to lecture at schools of nursing as well as to share in larger community and world affairs. She was on the International Council of Nurses, served two terms as

president of the National League for Nursing, and shared prominently in the development of the "Philadelphia Home Care Plan" for long-time illnesses. The Pennsylvania State Nurses Association in 1949 awarded her the Bronze Medal for Distinguished Service. At the time of her death, Miss Hubbard was a member of the Editorial Board of the American Journal of Public Health.

Marion E. Shand, who has succeeded Miss Hubbard as director of the Visiting Nurse Society of Philadelphia, is secretary of the Ruth Weaver Hubbard Foundation. Gifts to the foundation may be sent to her at 1340 Lombard St., Philadelphia 47.

Pennsylvania Rehabilitation Course

Because of the favorable response to the initial presentations, the University of Pennsylvania Rehabilitation Center is repeating the course on "Principles of Rehabilitation." Designed to present the basic concepts of rehabilitation in all its aspects, the course is open to physicians, registered nurses, occupational therapists, social workers, rehabilitation counselors, and others concerned with rehabilitation of the handicapped.

Enrollment for each of the four sessions ahead will be limited. A limited number of trainee stipends is made possible by the U. S. Office of Vocational Rehabilitation.

Dates when the course will be given are December 10–14, 1956, and February 4–8, April 22–26, and June 17–21, 1957. Further information from the Rehabilitation Center, Hospital of the University of Pennsylvania, Philadelphia 4, Pa.

Distinguished Award to Dr. Wilinsky

Charles F. Wilinsky, M.D., Fellow of the American Public Health Association, former executive director of the Beth Israel Hospital, Boston, and past president of both the American Public Health Association and the American Hospital Association, has received the 1956 Distinguished Service Award of the American Hospital Association for his early recognition of the need for coordinated activities between hospitals and health departments, and his continued devotion to strengthening this relationship. The award was presented at AHA's annual convention in Chicago on September 19.

Coordinating State Health Planning

Legislation in New York has created an Interdepartmental Health Resources Board charged with planning and executing health and mental health programs involving ten state agencies. The new board takes over a number of the functions of the former Mental Health Commission and replaces as well the Interdepartmental Health Council. The board is made up of the commissioners of mental hygiene, health, education, labor, social welfare, and correction, chairmen of the Division of Parole and of the Workmen's Compensation Board, and the director of the Joint Hospital Survey and Planning Commission.

Among the board's functions are:

1. Diagnosis, treatment, and rehabilitation of chronic alcoholics
2. Coordination of services and research in mental retardation
3. Study of residential treatment centers for emotionally disturbed children
4. Development of a master plan for the total array of personal health services to the elderly
5. Coordination of state rehabilitation services.

I. Jay Brightman, M.D., assistant commissioner for welfare medical services, State Health Department, assigned to the Department of Social Welfare as director of welfare medical services, has

been appointed executive director of the new board.

Medical Delegation to Soviet Union

A five-member delegation of medical scientists made a ten-day visit to the Soviet Union in September. The purpose of the visit was to confer with doctors in the Soviet Union on medical rehabilitation, with particular reference to cardiovascular diseases and on cardiovascular research and epidemiology. The visit was arranged at the invitation of the Soviet Ministry of Health and with the approval of the U. S. State Department.

The group, which attended the second European Congress on Cardiology in Stockholm on September 9, consisted of:

Paul Dudley White, M.D., President Eisenhower's heart consultant

James Watt, M.D., director, National Heart Institute

Howard A. Rusk, M.D., chairman, Department of Physical Medicine and Rehabilitation, New York University College of Medicine

Ancel Keys, Ph.D., director, Laboratory of Physiological Hygiene, University of Minnesota School of Public Health

Mark G. Field, Ph.D., medical sociologist on the staff of the Russian research center of Harvard University, who served as interpreter for the group.

Refuse Collection References

"Refuse Collection and Disposal, an annotated bibliography 1954–1955" is the second supplement in Public Health Bibliography Series No. 4 (P. H. S. Publication No. 91). There is now a 15-year bibliography divided into general sections of interest with individual articles arranged by author under each section. Among the 14 different sections are, for instance, sections on regulations, finances, and storage. Included is a short account of the nature of the article. Division of Sanitary Engineering Services, U. S. Public Health Service, Washington 25, D. C.

Federal Sanitary Engineers Organized

The Conference of Federal Sanitary Engineers has been organized to provide a means for uniting sanitary engineers (including industrial hygiene) engaged in professional practice within the federal government. Its interests are the development of better training, more effective recruitment, career planning for sanitary engineers employed in governmental agencies, and furthering the certification of sanitary engineers as carried on by the American Sanitary Engineering Intersociety Board. Any sanitary engineer who is a commissioned officer of the military services or the Public Health Service or who is a civilian employee of any department or agency of the United States government, is eligible for membership.

The following have been elected officers for the year beginning June 1, 1956:

President: Gordon E. McCallum, C.E., chief, Water Pollution Control Program, USPHS, Washington

President-Elect: Mark D. Hollis, chief, Sanitary Engineering Division, USPHS

Secretary-Treasurer: Lt. Col. Alvin F. Meyer, Jr., chief, Preventive Medicine Branch, Office of the Surgeon, Strategic Air Command, U. S. Air Force, Omaha, Neb.

Further information, including details of the next meeting in Washington D. C., in November, from Col. Meyer, 1502 S. 94th St., Omaha, Neb.

Virgin Islands Mental Health Team

The Health Department of the Virgin Islands now includes a mental health team with the recent appointment of a full-time psychiatrist. Other members of the team are a psychologist and nurse consultant.

Aging Conference Recommends

About 250 state and federal officials concerned with problems of older per-

sons took part in the federal-state Conference on Aging held in Washington in June, at the call of the Federal Council on Aging. This group dealt with six main areas, outlining goals for improving services for the aging and made specific recommendations as to federal and state responsibilities, organization, and technics.

About 50 recommendations were made in six main areas: employment, vocational rehabilitation, and retirement; income maintenance; physical and mental health; education and recreation; housing and living arrangements; and organization and functions in the states. Inherent in each of the recommendations is the responsibility of government in these various areas. Detailed proceedings will be available at a later date.

Dentistry Section Becomes Division

The Section of Dentistry of the Michigan Department of Health has been elevated to the status of Division of Public Health Dentistry. The division, headed by Fred Wertheimer, D.D.S., of Lansing, is responsible directly to the state health commissioner, Albert E. Heustis, M.D. In reporting the change, Dr. Heustis said: "It is believed that this adjustment will enable the Michigan Department of Health and the Michigan State Dental Association to make even greater progress in the improvement of the dental health of the people of Michigan."

PERSONALS

THEODORE J. BAUER, M.D.,* formerly medical officer in charge, Communicable Disease Center, PHS, Atlanta, Ga., has been appointed deputy chief of the agency's Bureau of State Services. He succeeds LEROY E. BURNEY, M.D.,* recently promoted to Surgeon General of the Service.

* Fellow.
† Member.

PHILIP A. BEARG, M.D.,* former director, Section of Epidemiology, Kansas State Department of Health, has been appointed director, Fife-Hamill Memorial Health Center, Philadelphia, Pa., succeeding BERNARD M. BLUM, M.D., M.P.H.,* who has resigned to enter the mental health field.

JOSEPH H. BUNZEL, Ph.D.,† formerly with the New York School of Social Work, is now associate professor for social research, School of Social Work, Richmond Professional Institute, College of William and Mary, Richmond, Va.

JOEL I. CONNOLLY,* public health engineer, Public Health Office, Mutual Security Administration, has been transferred from the Philippines to Taiwan, and his address is Mutual Security Mission to China, APO 63, San Francisco, Calif.

YOLANDE DOMINQUE, R.N.,† former public health nurse, Louisiana State Department of Health, is now public health nurse, Division of Indian Health, Public Health Service, stationed in Toadlena, N. M.

ROLLAND R. EIDE,† former hospital corpsman First Class, U. S. Naval Air Station, Atlantic City, N. J., is now pest control operator, Walker Chemical, Termite and Pest Control Co., Orlando, Fla.

HOWARD ENNES, JR., M.P.H.,* director, Bureau of Public Health, Equitable Life Assurance Society of the United States, New York City, was elected a vice-president (North America) of the International Union for Health Education of the Public at the Third International Conference held in Rome in May.

PETER J. FARAGO, M.D., former clinical investigator, Abbott Laboratories, Chicago, has been appointed deputy medical director, the U. S. Food and Drug Administration, Washington, D. C.

ROBERT E. FARBER, M.D.,† former district health officer, Southern Health District, Baltimore (Md.) Health Department, has been appointed district health officer, Western Health District.

ABRAHAM GELPERIN, M.D., Dr.P.H.,* former director, Des Moines-Polk County (Iowa) Health Department, has resigned to become assistant superintendent in charge of professional services and research, Dixon State School, for mental defectives, Dixon, Ill.

HELEN GIBBONS, former teacher of partially seeing children, Rockford, Ill., has been appointed consultant in education, National Society for the Prevention of Blindness, New York City.

MYRNIE A. GIFFORD, M.D., M.P.H.,† medical training consultant, Training Branch, Division of International Cooperation, Children's

Bureau, has retired and makes her home in Berkeley, Calif., with her sister.

JOGINDAR SINGH GREWAL, M.D.,† former pathologist, VA Hospital, Beckley, W. Va., is now director-pathologist, Division of Laboratories, Lowndes Memorial Hospital, Binghamton, N. Y.

BERTRAM W. HAINES, Sc.D., who has just received his doctorate from the Johns Hopkins School of Hygiene and Public Health, has been appointed to the newly created position of director, Bureau of Medical Care Research, Baltimore (Md.) Health Department.

JANET B. HARDY, M.D.,† director, Child Hygiene, Baltimore (Md.) Health Department, has been promoted to the newly created position of director, Section of Preventive Medicine.

GEORGE JAMES, M.D., M.P.H.,* former health officer, Akron, Ohio, has been appointed deputy commissioner, New York City Department of Health, succeeding EDWARD M. COHART, M.D., M.P.H.,* who has returned to Yale University, New Haven, Conn., as professor of preventive medicine.

ROBERT A. JAMES, former senior accountant, State Highway Commission, has been appointed administrative officer, Montana State Board of Health, Helena.

FRANCES KORD,† former director of health education, Massachusetts Tuberculosis and Health League, has been appointed an associate, Program Development, National Tuberculosis Association.

SEYMOUR J. KRESHOVER, M.D., D.D.S., former professor of oral pathology and diagnosis, Medical College of Virginia, has been appointed associate director, National Institute of Dental Research, Public Health Service, Bethesda, Md.

WEI-PING LOH, M.D., Ph.D., M.P.H.,† former assistant clinical pathologist, Quincy (Mass.) Hospital, is now clinical pathologist, Methodist Hospital, Gary, Ind.

F. EARLE LYMAN, Ph.D., former assistant chief, Entomology Branch, Communicable Disease Center of the Public Health Service, has been appointed chief of extramural programs, National Institute of Dental Research, Bethesda, Md.

RICHARD LYNESS, M.P.H., on educational leave at the University of California School of Public Health, where he received a master of public health degree, has returned to his work as entomologist, Division of Sanitation, Kansas State Board of Health, Topeka.

ROBERT MAHONEY,† former executive director, Southern Worcester County Health Association, has become director of nursing education, Rutland Veterans Administration Hospital, Rutland, Mass.

ALBERTA MALIN,† director of health education, Middlesex (Mass.) Health Association, has been appointed its executive director.

ARTHUR MASSEY, C.B.E., M.D.,* of the British Ministry of Pensions and National Insurance, London, was invested on July 10 with knighthood by Her Majesty Queen Elizabeth.

GORDON M. MEADE, M.D., has succeeded AIMS C. MCGUINNESS, M.D., as clinical director, Miners Memorial Hospital Association, United Mine Workers Health and Welfare Retirement Fund.

GERARD MULLIN,† former statistician and later director of personnel, Quincy (Mass.) Health Department, has been appointed head, Department of Statistics and assistant to the health commissioner, Hartford, Conn.

BARBARA R. NORTON, R.N., is senior supervisor of public health nursing in pediatrics, Division for the Handicapped, Bureau of Child Hygiene, Baltimore (Md.) Health Department.

ERMAL E. O'BRIEN, D.D.S., former dental consultant, Illinois Department of Public Health, has succeeded the retiring HARRY B. MILLHOFF, D.D.S., as chief, Division of Dental Hygiene, Ohio State Health Department.

F. ALEC PHILLIPS, former field representative, Nebraska Tuberculosis Association, is now field consultant, Wyoming Tuberculosis and Health Association.

R. GERALD RICE, M.D.,* former director, Division of Maternal and Child Health, Massachusetts Department of Public Health, has resigned to become director of a similar bureau, Pennsylvania Department of Public Health, Harrisburg.

JUDSON L. ROBERTSON, JR., sanitary engineer director, chief of Commissioned Reserve Development at Washington, D. C., headquarters, has retired from the Public Health Service.

PETER ROGATZ, M.D., M.P.H.,† former research associate, Hospital Council of Greater New York, is now associate director of professional services, Health Insurance Plan of Greater New York.

ALFRED E. H. RUTH † is now business manager, Virginia State Mental Hospital System, Richmond.

KENNETH V. SHASHEK, D.V.M., M.P.H.,† former field representative, Illinois State Division of Livestock Industry, is now public health veterinarian, Division of Health, St. Louis, Mo.

* Fellow.
† Member.

ELEANOR H. SMITH, M.D., M.P.H., has succeeded KENNETH I. E. MACLEOD, M.D.,* as medical director, Nashoba (Mass.) Associated Boards of Health.

AARON SPITZER, M.S., M.P.H.,† former health education consultant, Tuberculosis Institute of Chicago and Cook County, is now associate executive secretary, Health Division, Welfare Council of Metropolitan Chicago.

ROEBERT L. STEARMAN, Sc.D.,† formerly in the Department of Biostatistics, Johns Hopkins University, is now biometrician, National Institute of Arthritis and Metabolic Diseases, Bethesda, Md.

HARVEY B. STONE, M.D., Baltimore, Md., has succeeded ALAN GREGG, M.D.,† who has resigned as a member of the Health Resources Advisory Committee.

ANTOINE B. VALOIS, M.D.,* professor, Public Health School of Montreal University, has been appointed assistant to the director of health, Montreal Department of Health, Canada.

STANTON J. WARE, Ph.D.,† former public health engineer, Water Supply and Water Pollution Control, Public Health Service, is now principal research scientist, Laboratory of Climatology, Drexel Institute of Technology, Elmer, N. J.

SAM WARRINGTON, former engineer, Lubbock District Office, is now senior engineer, Texas State Department of Health, Austin, succeeding CLAYTON H. BILLINGS,† now on the staff of Public Works magazine, Ridgewood, N. J.

GEORGE E. WATERMAN, D.D.S., is chief of dental services, Bureau of Indian Health, Public Health Service, Washington, D. C.

JEANETTE V. WHITE, R.N., former managing editor, American Journal of Nursing and Nursing Outlook, has succeeded NELL V. BEEBY, R.N.,† as editor of the American Journal of Nursing. Miss Beeby will now devote full time to her responsibilities as executive editor of the Journal Company which publishes the Journal, Outlook, and Nursing Research.

ALICE E. WIGGINS, former chief physical therapist, Veteran's Hospital, Omaha, Neb., is now physical therapy consultant, Division of Maternal and Child Health, Wyoming Department of Public Health, Cheyenne.

HUNTINGTON WILLIAMS, M.D.,* was recently appointed to his sixth consecutive term of six years by Mayor Thomas D'Alesandro, Jr., as commissioner of health, Baltimore, Md.

* Fellow.
† Member.

DEATHS

NORMAN D. BEGG, M.D., director of the Regional Office for Europe of the World Health Organization on May 24.

EDMUND J. BUCKLEY,† district milk sanitarian, New York State Department of Health (Engineering and Sanitation Section).

CHARLES E. COTTON, JR.,† state milk and food sanitarian, Idaho Department of Public Health, Division of Environmental Sanitation, Boise, on June 23 (Engineering and Sanitation Section).

COLONEL JACK J. HINMAN, JR., of Iowa City, Iowa.

JOHN A. KINGSBURY, LL.D.,* chairman of the National Council of American-Soviet Friendship and former secretary and managing director of the Milbank Memorial Fund, at the age of 79 (Public Health Education Section).

MARY R. LAKEMAN, M.D.,† of Salem, Mass., at the age of 86 (Maternal and Child Health Section).

LANGDON PEARSE,* sanitary engineer, Sanitary District of Chicago, at the age of 78 (Engineering and Sanitation Section).

ROSCOE H. SUTTIE, professor emeritus of civil engineering, Yale University, New Haven, Conn., on July 30.

FRANCIS TRUDEAU, M.D., of Saranac Lake on July 19.

CONFERENCES AND DATES

American Public Health Association, 84th Annual Meeting, Atlantic City, N. J. Headquarters: Convention Hall, Atlantic City, N. J., November 12–16.

State and Regional Public Health Meetings:

California, Southern, Public Health Association. November 30.
Florida Public Health Association. Clearwater, Fla. October 18–20.
Mississippi Public Health Association. Jackson, Miss. December 5–7.
New Mexico Public Health Association. Albuquerque, N. M. October 17–19.
Tennessee Public Health Association. Nashville, Tenn. December 5–7.

Meetings of Other Organizations Coming in October, November, and December, 1956:

American Academy of Pediatrics. New York, N. Y. October 6–11.

American Association for the Advancement of Science. New York, N. Y. December 26–31.
American Association of Medical Record Librarians. Washington, D. C. October 1–5.
American Dental Association. Atlantic City, N. J. October 1–4.
American Dietetic Association. Milwaukee, Wis. October 9–12.
American Heart Association. Cincinnati, Ohio. October 27–31.
American Occupational Therapy Association. Minneapolis, Minn. October 1–4.
American Veterinary Medical Association. San Antonio, Tex. October 15–18.
Association of American Medical Colleges. Colorado Springs, Colo. November 12–14.
Association of Military Surgeons of the United States. Washington, D. C. November 12–14.
Family Service Association of America. Cincinnati, Ohio. November 14–17.
Federation of Sewage and Industrial Wastes Associations. Los Angeles, Calif. October 8–11.
International Congress on Medical Records (Second). Shoreham Hotel, Washington, D. C. October 1–5.
National Association for Mental Health. Washington, D. C. November 29–December 1.
National Safety Council. Conrad Hilton Hotel, Chicago, Ill. October 22–26.
National Social Welfare Assembly. New York, N. Y. December 11–12.
National Society for Crippled Children and Adults. Hotel Statler, Washington, D. C. October 28–31.
United Cerebral Palsy. Carter Hotel, Cleveland, Ohio. November 9–11.
World Medical Assembly. Havana, Cuba. October 9–14.

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American Aerovap, Inc., New York, N. Y.
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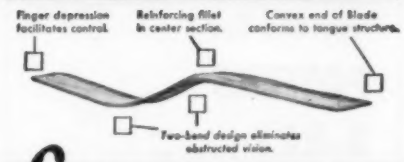
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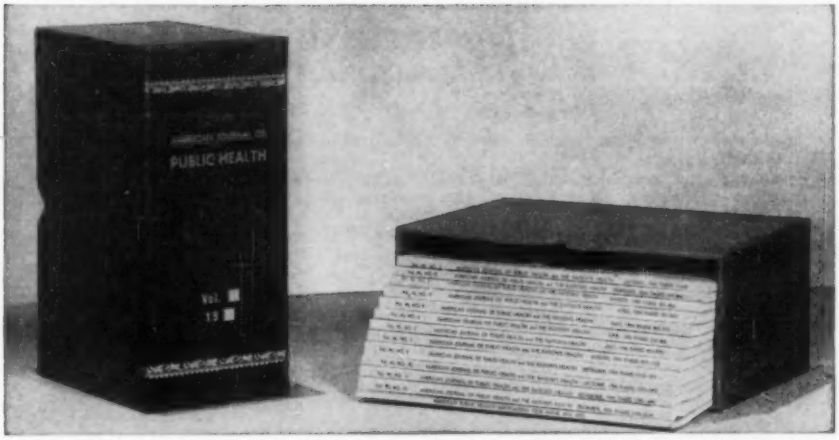

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1. Odel, H. M.: Nutrition in Cardiovascular Disease, in Wohl, M. G., and Goodhart, R. S.: Modern Nutrition in Health and Disease, Dietotherapy, Philadelphia, Lea & Febiger, 1955, p. 709.

2. Berg, C. P.: Utilization of Protein, J. Agr. & Food Chem. *3*:575 (July) 1955.

3. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, ed. 6, Baltimore, Williams & Wilkins, 1955, p. 638.

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